



ZS. 72







# BRITISH BIRDS

AN ILLUSTRATED MONTHLY MAGAZINE

Edited by

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# LIST OF ILLUSTRATIONS

## COLOUR PLATE

		PAGE
Plate 1	Collared Doves ( <i>Streptopelia decaocto</i> ), adult and young, Norfolk (painted by R. A. Richardson) ... .. facing	213

## PHOTOGRAPHIC PLATES IN BLACK AND WHITE

Plates 1-7	Red-necked Grebes ( <i>Podiceps griseigena</i> ), adults at nest, and habitat, Denmark and Germany (C. C. Doncaster, M. D. England and Ilse Makatsch) ... .. facing	18
Plate 8	Black-necked Grebe ( <i>Podiceps nigricollis</i> ), adult at nest, Germany (Ilse Makatsch) ... .. facing	19
Plates 9-11	Mediterranean Black-headed Gulls ( <i>Larus melanocephalus</i> ), adults, nest and eggs, and young, Hungary (Peter Beretzk) ... .. facing	60
Plates 12-13	Desert Wheatear ( <i>Oenanthe deserti</i> ), male in the hand, Co. Durham (James Alder) ... ..	
Plates 14-15	Hybrid Tree × House Sparrows ( <i>Passer montanus</i> × <i>domesticus</i> ), males in the hand, Dorset and Norfolk (E. H. Ware, Evan Jones and P. R. Clarke) ... ..	
Plate 16	Snipe ( <i>Capella gallinago</i> ), with abnormal bill, Westmorland (J. B. Bottomley) ... .. facing	61
Plates 17-24	Ptarmigan ( <i>Lagopus mutus</i> ), plumages and races, Scotland, Iceland, Sweden, Switzerland, Spitsbergen and Siberia (D. G. Andrew, H. Auger, R. P. Bille, L. Portenko, J. H. Sears, P. O. Swanberg and A. Tewnion) ... .. facing	106
Plates 25-32	Kites ( <i>Milvus milvus</i> ), adults and young at nest, and habitat, Spain (Eric Hosking) ... .. facing	150
Plates 33-35	Ortolan Buntings ( <i>Emberiza hortulana</i> ), adults at nest with young, Hungary (K. Koffán) ... .. facing	192
Plate 36	Upper: Ortolan Bunting ( <i>Emberiza hortulana</i> ), juvenile in the hand, Skokholm (Angela Davis) ... .. Lower: Little Bunting ( <i>Emberiza pusilla</i> ), sketch of head, Surrey (drawn by P. J. Hayman) ... .. facing	193
Plates 37-40	Great Grey Shrikes ( <i>Lanius excubitor</i> ), adults at nest, adult in flight, brood of young, and "larder", Spain, Switzerland and England (Eric Hosking and F. Götschi) ... .. facing	242
Plate 41	Left: A desert grey shrike ( <i>Lanius excubitor pallidirostris</i> ), first-winter bird in the hand, Fair Isle (H. A. Craw) ... .. Right: Collared Dove ( <i>Streptopelia decaocto</i> ), nestling, Norfolk (P. R. Clarke) ... ..	

# LIST OF ILLUSTRATIONS

Plate 42	Collared Dove ( <i>Streptopelia decaocto</i> ), adult, Norfolk (R. P. Bagnall-Oakeley) ... ..	
Plates 43-45	Bee-eaters ( <i>Merops apiaster</i> ), nest-excavation and courtship-feeding, Spain (Eric Hosking) ... ..	
Plates 46-47	Dippers ( <i>Cinclus cinclus</i> ), to illustrate the winking action (James Alder) ... ..	
Plate 48	Great Crested Grebes ( <i>Podiceps cristatus</i> ), penguin-dance, Holland (J. H. Drenth) ... .. facing	243
Plates 49-51	Storm Petrels ( <i>Hydrobates pelagicus</i> ), adult and egg, and stages in growth of chick, Skokholm (Angela Davis) facing	380
Plates 52-55	Sooty Terns ( <i>Sterna fuscata</i> ), views of colony, adults on nests, young, and adults in flight, Seychelles and Australia (M. W. Ridley and John Warham) ... ..	
Plate 56	Impressions of birds on windows, London and Birmingham (Gilchrist Studio and H. S. Houghton) ... facing	381
Plates 57-62	Anting by Wood Thrush ( <i>Hylocichla ustelina</i> ), Blue Jay ( <i>Cyanocitta cristata</i> ), American Robin ( <i>Turdus migratorius</i> ), Starling ( <i>Sturnus vulgaris</i> ) and Jay ( <i>Garrulus glandarius</i> ) in captivity (Bernard Corby, Bruce R. Young and Hans Löhrl) ... .. facing	424
Plate 63	Black-throated Diver ( <i>Gavia arctica</i> ), habitat and unusual nest, Sweden (M. D. England) ... ..	
Plate 64	Long-tailed Duck ( <i>Clangula hyemalis</i> ) and Harlequin Duck ( <i>Histrionicus histrionicus</i> ), sketches of juvenile plumages and bill-shapes (drawn by V. C. Wynne-Edwards) ... .. facing	425
Plates 65-68	Eagle Owls ( <i>Bubo bubo</i> ), adult female in flight and at nest, Sweden (Kurt Ellström and Enar Sjöberg) facing	472
Plates 69-80	Habitats and birds in the Coto Doñana and the Camargue, including Little Egrets ( <i>Egretta garzetta</i> ), Cattle Egrets ( <i>Ardeola ibis</i> ), Squacco Heron ( <i>Ardeola ralloides</i> ), Night Heron ( <i>Nycticorax nycticorax</i> ), Black-winged Stilts ( <i>Himantopus himantopus</i> ), Flamingos ( <i>Phoenicopterus ruber</i> ), Kentish Plover ( <i>Charadrius alexandrinus</i> ), Pratincole ( <i>Glarcula pratincola</i> ) and Gull-billed Terns ( <i>Gelochelidon nilotica</i> ) and nesting-areas of other species (Eric Hosking, G. K. Yeates and E. M. Nicholson) facing	520



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JANUARY 1957

THREE SHILLINGS

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## CONTENTS OF VOLUME L, NUMBER 1, JANUARY 1957

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	PAGE
Editorial: Increase in subscription rates ... ..	1
Notes on Tufted Duck in St. James's Park, London. By E. H. Gillham	2
The Chaffinch migration in North Devon. By Dr. David Lack ... ..	10
D.D.T. poisoning of birds. By Victor A. D. Sales ... ..	20
Photographic studies of some less familiar birds. LXXVII—Red-necked and Black-necked Grebes. Photographed by C. C. Doncaster, M. D. England and Ilse Makatsch (plates 1-8). Text by I. J. Ferguson-Lees ... ..	23
Song-posts of the Blackbird in a built-up area. By Derek C. Hulme ...	25
Notes:—	
Group-display of Smews (R. A. O. Hickling) ... ..	31
Alarm-note of Whimbrel (T. A. W. Davis) ... ..	31
Avocets in Derbyshire (R. H. Appleby and D. C. Hulme) ... ..	32
Aggressive behaviour of Common Sandpiper (Bryan L. Sage) ... ..	32
Shags drying wings on water (C. H. Fry) ... ..	33
Review:—	
<i>Bird Recognition</i> , 3. By James Fisher ... ..	33
Letters:—	
"Atmospheric turbulence and bird flight" (G. H. Forster) ... ..	34
Birds' methods of estimating flight-speeds (Dr. C. J. F. Coombs) ... ..	35
"Duncock" and "Hedge Sparrow" (Rev. Edward A. Armstrong) ... ..	36

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Cover photograph by G. K. Yeates: Black-throated Diver (*Gavia arctica*)



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# BRITISH BIRDS

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## EDITORIAL

### INCREASE IN SUBSCRIPTION RATES

IT IS only two years since the plan for developing *British Birds* in the face of increasing costs caused our Publishers to raise the annual subscription from 25 shillings to 30 shillings, and the monthly rate from half-a-crown to 3 shillings. Yet the events of 1956 have now made it absolutely imperative that there should be a further increase of 5 shillings on the annual subscription and we would like to explain just why this was unavoidable.

During the early months of last year, as is well known, a dispute in the printing industry helped to cause great delays in publication, from which we are only now recovering, and resulted in increases of between 15% and 25% in production costs. As a result, *British Birds* has become uneconomic to produce at the present subscription rate. *British Birds* is not alone in facing this problem, and the Editors of *Nature* have recently given some striking facts and figures about it in an editorial announcing a similar step. The Publishers, however, wish to maintain their policy of administering *British Birds* in the broad spirit of a trust for British ornithology, and have made the present increases as small as they feel possible to maintain standards. For mailing service, and to recover the expenses of postage, despatch and maintenance of addressing lists, the Publishers have had to make a charge of 5/-.

We know that there are many who do not subscribe to *British Birds* but borrow the copies of their friends or those provided by reading circles. If some of these would become subscribers and if all readers would help to secure new subscribers, the rise in circulation would be an insurance against further price rises due to the continual increases in production costs. The Publishers very much regret that increases have again proved necessary and appreciate the goodwill of their subscribers.

In conclusion, we would like to draw our readers' attention to the fact that this is our half-centenary year, and on the 1st June 1957 *British Birds* will be 50 years of age. We are planning several special items in celebration of that event.

# NOTES ON TUFTED DUCK IN ST. JAMES'S PARK, LONDON

By E. H. GILLHAM

## INTRODUCTION

SINCE 1925, unpinioned Tufted Duck (*Aythya fuligula*) have bred in St. James's Park which has been their main breeding-area in Inner London for many years (Cramp and Teagle, 1952).

This paper covers 1953-55 inclusive when the writer visited the Park on just over 200 days between the end of April and early October. Visits were made as follows:—

On 45 days in the 71-day period 1st August-10th October 1953

On 115 days in the 166-day period 27th April-9th October 1954

On 42 days in the 169-day period 29th April-14th October 1955

Throughout all three periods visits were regular and on average were made on 4 days out of 7 in 1953; on 5 days out of 7 in 1954; and on 1 day out of every 7 until 25th August, and 5 out of every 7 until 30th September, in 1955. On 20-25% of the 202 days, visits occurred twice in a day.

On 1st August 1953, adult female Tufted Ducks, all of them attending tiny downy young were dispersed over the lake between the Suspension Bridge and the Horseguards end, and the figures reached were 8 certain females, each with a brood, plus probably two other females with broods, while the combined total of downy young was estimated at not less than 60. The actual age of the ducklings was unknown on 1st August, but subsequent events showed that by taking *The Handbook's* fledging-period of six weeks as a minimum, and by close observation on the ducklings, two-thirds of the broods were then between one and seven days old, and the rest about ten days old. There were no other ducklings apart from those accompanied by their mothers.

At first, the intention of the watch was to note the date when all of the females had abandoned their young, but as conditions for observing Tufted were so ideal, the study was extended over the next two years.

It was soon apparent that Tufted had a great liking for bread and joined with the other ducks in "begging" for food at two of the main feeding-points, namely, near the Cake House and below the Suspension Bridge.

During the three years at least 780 counts of the Tufted Duck population were made and each one of these was often composed of a number of separate counts. For example, to fix the figure of Tufted feeding and diving, either by the Cake House or the Bridge, might involve a dozen attempts before a correct total was

arrived at. Each visit, however, was not merely a series of counts, but amounted to a close examination of the population as well, especially at the feeding points where one could regularly examine 60-70% of the population at leisure. Not infrequently 80-90% of the population put in an appearance at the two main points in the course of an hour, while during any three separate day-watch periods, it is highly probable that all of the population came under close scrutiny. Observations and counts were not hindered by aquatic vegetation, for there was no emergent cover anywhere around the lake-shore which includes the promontory known as Duck Island. There were few points around the whole lake-shore from which one could not identify Tufted Duck though from a few positions it was difficult to distinguish between dozing females and fully-grown juveniles especially when several birds were hidden by the overhanging trees of Duck Island. If a few birds were hidden from view one afternoon, as likely as not they made an appearance at a feeding-point either in the evening or on the following day.

#### *Numbers of pairs.*

The number of pairs present in each of the three years was as follows:

1953 (based on broods seen): 8-10

1954 (based on pairs counted): 15

1955 (based on pairs counted): 12-14

Allowance must be made for the late commencement of the watch period in 1953 because the early-nesting pairs which had been unsuccessful in their breeding attempts are likely to have left the lake by 1st August. The average number of breeding pairs each season would have been between 12 and 15.

#### *Numbers of non-breeding birds.*

In 1954 and 1955 there were a few unmated non-breeding adults present. In the first year (when watching was particularly intensive) these totalled 5 males and 3 females. One of the surplus males had a fixation for Mallard (*Anas platyrhynchos*) and associated only with courting parties of that species which it accompanied constantly between 27th April and 17th May. This drake Tufted ignored females of his own species and tried only to court Mallard.

#### *Nest-sites.*

The main nesting-areas of Tufted are on the promontory known as Duck Island and on the island at the Buckingham Palace end. In 1954, Mr. W. H. Punter, the Bird Keeper, found 14 nests on Duck Island and I found two (seen from the lake-shore) on the second site. It is quite certain that at least another four nests were



situated on the second site and the total of *ca.* 20 nests estimated indicates additional attempts by some of the pairs.

Apart from normal sites amongst ground-vegetation single nests were found in each of the following:— in old Mallard's, Coot's (*Fulica atra*), and Moorhen's (*Gallinula chloropus*) nests; in a drainpipe, an artificial burrow, a hollow tree-stump, and in a hole in a rockery. Also, a nest was situated outside the Park in a flower-bed opposite Buckingham Palace and over fifty yards from the lake.

#### DESERTION OF YOUNG BY THE FEMALE

Hochbaum (1944) found that all female diving ducks which bred in the Delta marshes of Southern Manitoba deserted their broods before the young could fly. In North Kent I have several times detected the presence of orphaned Pochard (*Aythya ferina*) aged between three and seven weeks old. Desertions at St. James's Park are indicated by the following declining totals of females accompanying broods:—

1953:	1st August	at least 8 females with broods
	16th August	only 5 females still attending young
	21st-26th August	only 4 females still attending young
	29th August	all females had abandoned their young

Coinciding with the reduction of family parties, unattached flightless ducklings and unattached females became noticeable. Three of four unattached females seen in the period 22nd-29th August were flightless.

1955:	29th July-12th August	9 broods hatched
	19th August	only 6 females still attending young
	29th August	only 5 females still attending young
	3rd September	only 1 female still attending young
	5th September	all females had abandoned their young

In these two years, all females deserted their broods before the young could fly. In one instance a brood was left when a few days old (these young reared themselves), but most frequently the desertions occurred two-thirds of the way through the fledging-period. Occasionally a female looked after her brood until the beginning of the final week of the juvenile fledging-period. During 1954 and 1955 a total of five female Pochard which bred successfully in the Park deserted their broods before the young could fly.

#### MORTALITY OF YOUNG

The following counts of young indicate the mortality:—

1953:	1st August	minimum total of downy young 60
	14th August	total of downy young counted 35
	21st August-19th September	total of downy young counted 25 approx.

1955: 12th August	minimum total of downy young 52
19th August	total of downy young counted 39
26th August-16th September	total of downy young counted 38 approx.

The cold and wet summer of 1954 was a disastrous one for breeding Tufted and I saw only two different broods, each of 4 ducklings. One of these broods died within a few days and the others were all dead within fourteen days. Mr. Punter considered that another five broods were hatched (apart from some eggs hatched and young reared and retained in captivity): all these ducklings must have died within 48 hours.

It is difficult to arrive at the average mortality percentage among broods since exact clutch-sizes and the actual numbers of young to leave the nest are unknown. In 1954 casualties to eggs or hatched young were definitely 100%. Since the number of pairs breeding or attempting breeding each year was roughly the same I consider that in 1953 only about 20% of the potential hatch reached the flying stage and in 1955 only 30%. Most ducklings which die, succumb in the first half of the fledging-period, and often in the first fourteen days.

#### MOVEMENTS OF BREEDING FEMALES

Between 21st and 26th August 1953, I found four females still attending their broods and four unattached females, three of the latter being flightless. After 29th August, when the remaining mothers had abandoned their young a special watch was kept for further moulting females. However, between 31st August and 11th September, not more than four adult females were found altogether; and from 12th to 17th September, three only, one of which was flightless. From these observations, I believe that the first four females to desert their young shed their flight-feathers on the lake, and that two of them departed shortly after the completion of the wing-moult. Of the last four females to abandon their young, two or possibly three moved off to complete their wing-moult elsewhere, only one for certain spending the flightless period on the lake.

Ample confirmation of this movement of adult females before or after the wing-moult was forthcoming in the next two years. In 1954, I knew of only 3 females which completed their wing-moult on the lake and most breeding females left the lake quickly after their final unsuccessful breeding attempts. For example, on 29th July there were 14 females; on 9th August, 4; and on 31st August, only 2 females.

In 1955, six females completed their wing-moult on the lake. Of these, however, one was known to be a non-breeder (*Line-wing*, see page 7), and another in full wing-moult on 7th October was believed to have been an immigrant.

On balance it is safe to say that in the three years one sixth to one half of the females (mostly breeding birds) moulted their flight-

feathers on the lake. The departure of the females occurred mainly in August and in the first half of September.

#### FEMALES IN WING-MOULT

The earliest that I have seen a flightless female is 21st July and the latest 7th October. On two occasions *flightless* females were observed attending young and defending them when other ducks swam close. In spite of many years' experience with eight species of duck I have never before seen *flightless* females in attendance on their broods. The approach of the female's wing-moult normally leads to the abandonment of young in diving ducks and Shelduck (*Tadorna tadorna*), whereas surface-feeding mothers stay with their broods at least until the young reach the flying stage and only occasionally desert their broods in the final week of fledging.

#### ADULT DRAKES

From 1st August to 23rd September 1953, only one adult male was seen on the lake. Assuming that this was a former mate of one of the breeding females, it was clear that the other breeding drakes left the lake some time prior to 1st August for the purpose of the wing-moult. This resident bird could be recognized by plumage and bill-markings and by the fact that he was ringed. He was still present on 10th October.

In 1954 there were, at most, 20 adult males until the fourth week of June; by 10th August, only 2; from 25th August to 3rd September, nil, and from 7th to 16th September, only 1.

In 1955, all drakes had gone by 22nd July, and none was present until 3rd September after which 1-3 were noted during the next fourteen days.

The drakes' departure to their moulting-grounds is completed in July and during the three years I knew of only two males which moulted their flight-feathers on the lake.

#### DEPARTURE OF YOUNG

In 1953 the young took to the wing between 4th and 19th September. During 20th-22nd September it was rough and windy, and counts of juveniles on the last two of these three days were of little value. On 23rd September, however, it was clear that some had already gone and from then on there was a gradual decline until 6th October when only approximately a fifth of the juveniles still remained. Counts of juveniles were as follows:— 19th September, 25; 23rd September, 17; 24th September, 15; noon 25th September, 15, evening, 12; 26th September, 10; morning 27th September, 13, noon, 8; 28th, 29th, 30th September, 6; 1st October, 5; 3rd, 5th, 6th October, 4. From 27th September some immigrant juveniles were detected so the figures after that date may refer to replacements and not necessarily to locally-bred birds.



In 1955, most young were free-flying in the same period, i.e. between 4th and 19th September, and the number of young to reach this stage was *ca.* 38. Departure began from 17th September, and on 19th September there were 29 which fell to 21 eight days later. From 28th September numbers fluctuated from 32 on that date to 24 on 7th October, and up again to about 30 on 14th October. The increase from 28th September is more likely to have been due to immigrants than to birds having departed and then returned.

Any doubt as to the existence of a small passage of juveniles should be dispelled by events in 1954 *when no juveniles were reared on the lake*. In that year two juveniles arrived with some females on 30th September and on 1st October there were several more among a total of 16. During the next eight days there were up to 8 juveniles present on the lake.

In 1953 the departure of juveniles by the first week of October was more complete than in 1955.

#### MIGRANTS

Up to 23rd September 1953 no migrants had been detected, and from 12th to 22nd September only the same four adults had been seen—1 drake and 3 ducks—all of which could be recognized individually. For easy recognition purposes the females were given the following names:— *Torn-wing*, *Line-wing* and *Scaup-face*. The first had a damaged wing on which part of the white secondaries always showed as a broad white bar when it was swimming. The second had the opposite wing slightly damaged on which the white showed similarly but only as a narrow white line. In addition *Line-wing* was ringed. *Scaup-face* had (for a period) the largest white patch surrounding the base of her bill that I have ever seen on a Tufted Duck. Through individual recognition both of these adults and of a high proportion of the newcomers which appeared from 22nd/23rd September onwards, a movement was detected which otherwise might have been overlooked, especially if based on counts alone. Between 23rd September and 7th October the maximum daily totals showed a perfectly steady decline from 23 Tufted Duck on the first date to 10 on 7th October, excepting for one marked increase on 27th September which was not apparent later in the day.

During the period 23rd September-10th October probably up to 26 and at the very least 16 (if one allows for the possibility of some having gone away and then returned) immigrant Tufted Duck arrived, of which about 60% passed on (see Table). Except for recognition of a ringed bird on 8th October, there was no certain separation of immigrant and Park-bred juveniles. Most of the immigrants were adults.

On 27th September, as I left the Park, five juveniles were flying erratically over the lake, and shortly afterwards two adult males believed to have been the two immigrant adult drakes (see Table)

TABLE—MIGRANT TUFTED DUCKS (*Aythya fuligula*) IN ST. JAMES'S PARK IN 1953

Approximate date of arrival	Adult male	Adult female	Juvenile	Approximate date of departure
Sept. 22/23		2 (both ringed)		1 by Sept. 25
Sept. 23/24	1 (had a damaged crest)			by Sept. 25
		1 (had only one leg)		by Oct. 2
Sept. 24/25	1 (in eclipse)			by Sept. 29
		1 (no ring on legs)		
Sept. 26-27	2 (almost full plumage)			by noon Sept. 27
			5	? same 5 by noon Sept. 27
Oct. 4/5	2 (one had no crest)			1 by Oct. 6
Oct. 7/8	1 (in eclipse: a different bird from the one mentioned above)	7 (two of them ringed)	3 (one of them ringed)	4 or 5 females and 1 or 2 juveniles had gone by Oct. 10

flew low over Buckingham Palace to the S.W. On returning to the Park an hour later and making another series of counts I found that two males and five juveniles had gone.

Migrants could frequently be picked out by their behaviour, most of them being less tame than locals on arrival. For example, on 27th September there were 3 adult males together thirty yards from the lake-shore. After studying them for a moment and deciding which was my "resident" male, I threw a piece of bread in the water, but only the resident male swam quickly towards me. Usually the migrants, which in all probability came in over-



night, were tired, and were to be found dozing off-shore just after arrival. Within a day or two, however, they adapted themselves to the new surroundings and joined the other Tufted Ducks at the feeding-points.

In 1954, the breeding population (adults only—no free-flying young this year) reached their lowest numerical ebb on 29th September when the only bird present was an adult female (*Line-wing*). For the next ten days numbers fluctuated, and soared to 19 birds on 5th October; then down to 2 three days later, and up to 26 on 9th October.

In 1955, numbers dropped gradually to 21 on 24th September; then rose to 25 on the 26th, 40 on the 28th, and had dropped slightly to 35 on 14th October.

#### BEHAVIOUR OF ABANDONED YOUNG

At Delta, Hochbaum found that parentless broods of diving ducks banded together, the younger ducklings following the lead of the older ones. In both 1953 and 1955 at St. James's Park it was found that, after being deserted by their mothers, the Tufted ducklings were mainly individualists roaming the lake on their own. Odd youngsters, however, frequently attached themselves, temporarily, to other families: for example, on 21st, 22nd and 26th August 1953, counts of three of the four broods present showed fluctuations in numbers. Sometimes a female would drive away a duckling which tried to join her brood, thus indicating that she recognized her own young. On one occasion an orphaned duckling was observed to take special care in avoiding contact with a duck and brood of its own species, for when a family paddled close the lone youngster scuttled across the water and dived in order to keep out of their way.

The first sign of flocking was noticed on 24th September in 1953 on which day birds were particularly active on the wing. In 1955 the first flocking was observed on 12th September.

#### ACKNOWLEDGEMENTS

I am indebted to W. H. Punter and W. G. Teagle of the Ministry of Works for supplying me with information concerning nests.

#### SUMMARY

1. The breeding and post-breeding populations of Tufted Duck in St. James's Park, London, were studied between late April and early October in the years 1953, 1954, and 1955.

2. All breeding females were found to desert their broods before the young could fly.

3. The males departed for their moulting-grounds mainly in July.

4. Some breeding females completed their wing-moult on the

breeding-lake, but most left the lake to complete their wing-moult elsewhere.

5. There was no marked tendency for abandoned and still flightless broods to form into large "crèches" under one female, or to form into groups led by larger ducklings.

6. The departure of locally bred young coincided with a passage of immigrants—mainly adults.

7. Mortality among the young is discussed.

8. Notes are given on the number of pairs, non-breeding birds and nest-sites.

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## THE CHAFFINCH MIGRATION IN NORTH DEVON

By DAVID LACK

(*Edward Grey Institute of Field Ornithology, Oxford*)

#### INTRODUCTION

*Dr. Bannerman.*

Dr. D. A. Bannerman, author of *The Birds of Tropical West Africa* and, with G. E. Lodge, of a new *The Birds of the British Isles*, now in progress, reached the age of seventy on 27th November 1956, and the present paper is offered as a birthday tribute, since it follows up observations initiated by him in this magazine. Bannerman (1944, 1945) reported a strong coasting movement of Chaffinches (*Fringilla coelebs*) southwards, and occasionally northwards, in late October at Vention on the west coast of N. Devon, where the coast runs north and south. Similar movements from east to west, and sometimes west to east, were later recorded at Ilfracombe, a few miles further north, where the north coast runs east and west (Allen, 1944; Cutcliffe, in Wood 1950). To discover more about these movements I stayed at Woolacombe from 20th to 29th October 1956.

Round Oxford, in places where their movements are not deflected by geographical features, I have found Chaffinches travelling (i) in very small numbers slightly east of south, mainly

in early October, and (ii) in much larger numbers W.N.W., chiefly in late October and early November. Two similar movements occur in Kent (Lack 1954), and over Lundy off the N. Devon coast (Davis, 1954), and they are probably general in southern England (Snow, 1953). The late date suggests that Bannerman's movement might be related to the W.N.W. passage, the birds in which are presumably destined for Ireland (*cf.* Lack, 1952, at the Land's End).

#### OBSERVATIONS AT BULL POINT

As shown in Fig. 1, the N. Devon coast runs nearly east and west along the south shore of the Bristol Channel, then at Bull and Morte Points it turns sharply south for some twelve miles, after which it again turns west to Hartland Point, and then again runs south. I decided to watch on the "corner", first at Morte Point, a mile south of, but projecting a mile west of, Bull Point (see Fig. 2). At Morte Point, however, there was no appreciable migration on two days when conditions were highly suitable for a coastal movement; instead, Chaffinches were cutting inland across the base of the headland, both when coasting south (on 21st October) and when coasting north (on 26th October). The critical place proved to be Bull Point, where I watched each day from 22nd to 29th October.



FIG. 1—OUTLINE MAP SHOWING THE GEOGRAPHICAL POSITION OF THE NORTH DEVON COAST IN RELATION TO THE REST OF SOUTH-WEST ENGLAND, WALES AND SOUTH-EAST IRELAND

On three of these days the wind was very strong, on 24th October S.W., on 25th October W.N.W. and on 29th October

N.N.W., and no Chaffinches passed on the coast, though a few small parties drifted west in sheltered places a mile or so inland. The cessation of migration by Chaffinches in strong winds has been noted previously by Bannerman (1945) and Lack (1952, 1954).

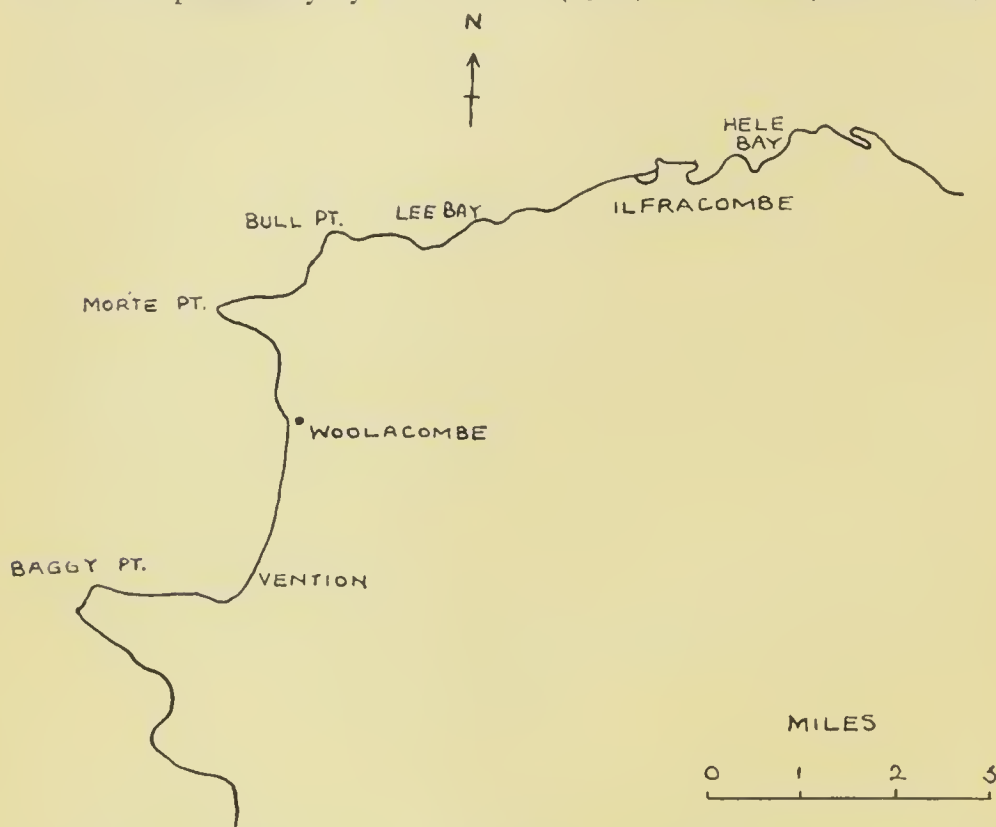


FIG. 2—OUTLINE MAP OF PART OF THE NORTH DEVON COAST SHOWING THE SHAPE OF THE COASTLINE AND THE POSITIONS OF LOCALITIES MENTIONED IN THE TEXT

On three other days in fine weather with a moderate wind between S.W. and W., there was a large passage at Bull Point. On 22nd October with a S.W. wind, 9,170 individuals were counted between 7 and 8 a.m. G.M.T., but the total was certainly larger, as some of the flocks were extremely high while others turned from west to south rather inland of the Point, so that they were liable to be overlooked from the Point itself. Sunrise was at 7 a.m. The passage was most intense from its start at 6.45 until 7.10 a.m., but I counted only during the last ten minutes of this time, in which I saw at least 2,880 individuals. I estimate that at least 7,500 birds passed in the first half-hour of the movement. On 23rd October, with a slightly stronger S.S.W. wind, 2,530 were counted in the first hour of the movement, and on 28th October, with a light to moderate west wind, 2,815 passed in the first hour, 670 in the second and 332 in the third hour, starting at 7.10 a.m. The movement on 22nd October appears to be the largest of this species so far reported in Britain; further evidence is required to show whether this was exceptional or normal at



Bull Point at this time of year, but the large numbers reported by Bannerman at Vention suggest that it may be normal.

On 22nd, 23rd and 28th October, most flocks reached Bull Point from the east, coasting west along the north coast, though some appeared to come from inland travelling rather north of west. On 22nd October, most then went straight out to sea W.N.W., none low, many a few hundred feet up and many near the limit of visibility upward. Other flocks turned sharply south at the Point in a typical coasting movement. On 23rd October, with only a slight change in weather (slightly cooler, with a slightly stronger S.S.W. wind), most of the birds turned south, though many others went out W.N.W. Some high parties from inland turned right back S.E. on reaching the coast, then returned, rising, and headed out seaward again. This was also seen on other days. On 28th October, in the first hour of the movement with a moderate wind, nearly all turned from west to south down the coast. In the second hour, with a light wind, probably as many went out to sea as turned along the coast. Almost all of those going out to sea were close to the limit of visibility upward through  $12\times$  field-glasses, but most of those that turned south were flying lower. In the third hour, with a stronger wind, most of the flocks flew lower again, but nevertheless many went out to sea at a moderate height. The direction in which the birds headed out to sea was much more variable than on the other two days, flocks being followed until they were out of sight on bearings ranging between N.N.E. and W.S.W.; most left either N.W. or, having partly turned south and then headed out again, nearly due west.

Finally, there were two days with moderate or light northerly winds, when, in marked contrast to the other days, nearly all the Chaffinches reached Bull Point from the south, coasting north along the west coast (but cutting across the base of Morte Point). On 26th October, with a moderate N.N.W. wind, 290 were counted in the first  $\frac{3}{4}$ -hour (360 per hour) and on 27th October, with a light N.E. wind, 480 in the first hour of the passage. On 26th October, almost every party went out to sea north or N.N.W. (into the wind), but a few flew back a little way south, then turned, rose and headed out again, while a very few coasted east. On 27th October, in contrast, all turned and coasted east (partly into the wind), save for one party that rose high above me to the limit of the  $12\times$  glasses, and were still heading seawards when lost to sight.

#### COASTING MOVEMENTS

These observations at Bull Point indicated that, with west or S.W. winds, many Chaffinches coasted west along the north coast and then turned south along the west coast, whereas with northerly winds, many coasted north along the west coast and, with a N.E. wind (but not with a N.N.W. wind), then turned east along the north coast. The few observations made away from Bull Point support this view.

Between 7.30 and 11 a.m. on 21st October, with a west wind, many flocks were seen flying high west over Lee Bay, a mile east of Bull Point, and many flew high south over the base of Morte Point, a mile south of Bull Point. On 23rd October, between 9.50 and 11.30 a.m. (probably near the end of the day's movement), a very few passed west at Hele Bay, five miles east of Bull Point. On 26th October, many crossed over the base of Morte Point flying north, but only two parties of 3 each flew east at Hele Bay during 10-11 a.m., while a party of 12 that had been feeding here later drifted west, not east. On 27th October, there was a steady passage east at Hele Bay, 465 passing in 40 minutes from 8.35 a.m. These scattered observations are in accord with those made at Vention and near Ilfracombe mentioned in the opening paragraph. At Vention the coastal passage was usually, though not quite always, against the wind (Bannerman, 1944, 1945).

#### INTERPRETATION OF COASTING MOVEMENTS

On the basis of these Devon observations, together with those made in recent years on Chaffinches in other areas, I suggest the following interpretation of the late October movements in North Devon, though further study is needed before firm conclusions can be reached. Chaffinches heading for Ireland travel W.N.W. across southern England. Probably some of these, especially in still weather, head straight out to sea W.N.W. on reaching the North Devon coast; but many others turn and travel along the coast for a while. With a west or S.W. wind, many that reach the north coast (the south shore of the Bristol Channel) turn west and continue to Bull Point, where, depending on the conditions, some take off W.N.W. over the sea and others turn and coast south. With a northerly wind, on the other hand, many that reach the west coast of North Devon turn and coast north, reaching Bull Point, where they either take off, or, if the wind also has an easterly element, they turn and coast east. Although these two coasting movements proceed in opposite directions, they usually occur with different winds, and so on different days, the tendency being to coast against the wind, and I suggest that the same primary passage (W.N.W. to Ireland) is involved in both cases.

The Chaffinches that turn south along the west coast presumably take off W.N.W. over the sea later on, perhaps on the following day. The numbers coasting south are so much larger in North Devon than in the Land's End (*cf.* Laek, 1952) that most flocks have evidently taken off before reaching the Land's End. This fits the view that most of those coasting south in Devon are destined for Ireland. Further, even as far south as Land's End, some flocks coasting south have been seen to turn and head out to sea W.N.W. But there is a possibility that some of those coasting south in North Devon belong to the other movement,

mentioned earlier, with a standard direction of S.S.E., which takes places mainly in the first part of October.

Birds with a standard direction of W.N.W. which coast southwards are temporarily travelling at an angle of about  $110^{\circ}$  to their standard direction. It is much more remarkable that such birds should, on occasion, coast due east, almost directly away from their standard direction, and from their presumed destination in Ireland. But I think the reason is clear from a consideration of what else they might do in a northerly wind. The birds concerned have reached the west coast of North Devon and have then, as usual, turned and coasted against the wind, north up the coast. When they reach Bull Point, they cannot continue coasting north, as there is no more coast to the north. If they set out W.N.W. for Ireland, they would have a cross wind, which migrants tend to avoid on a sea crossing, moreover the wind would be blowing in such a direction as to drift them away from all land into the open Atlantic; further, the coasting birds are in any case those which, on the day in question, have avoided putting out to sea earlier on. If, instead, they turned directly back down the coast along the way that they had come, they would be coasting with a following wind, which migrants also avoid. It might therefore be suggested that they would stop migrating and alight round Bull Point, but it is reasonable to suppose that in most cases their migratory urge would be too strong to be checked thus easily, and further that it would be disadvantageous if thousands of migrants were to alight in a small area unsuitable for feeding or resting, merely because of a turn in the coast. Hence it would seem most advantageous for them to continue their coasting movement into the wind, even though this means temporarily travelling east, away from their standard direction. Presumably they would not cover many miles before stopping that day. I therefore regard this as an extreme instance of what Vlucgel (1956) has termed "retromigration" (because the term "reverse migration" has been used in two different senses). That, at Bull Point, this north-then-east movement involves many fewer individuals than the west-then-south movement on other days seems due, in part at least, to the fact that there is only a small stretch of coast south of Bull Point, but a long stretch east of it, from which coasting birds are likely to be drawn (see Fig. 1).

In the Land's End in late October, with a S.W. wind, Chaffinches continue coasting south to the southerly tip of the land at Gwennap Head and then turn and coast east. I earlier (Lack, 1952) suggested that these birds might be destined for Spain, but now suggest that this may be another extreme instance of retromigration (similar to the coasting east at Bull Point with a N.E. wind), and that at least many of those Chaffinches travelling east from Gwennap Head are destined for Ireland.

Normally, at any one place on any one day, a coasting movement occurred in only one direction, into the wind. But at Vention



on 8th November 1944, Bannerman (1945) reported many flocks travelling south, and others travelling north, at the same time. This may also happen, apparently, near Ilfracombe, but here west and east (Cutcliffe, in Wood, 1950) (and near there on 26th October I did see two flocks coasting east and one coasting west, as already mentioned). Now if conditions were favourable for migration inland but unfavourable for putting out to sea, so that the birds turned and coasted, and if the wind were such that it did not have a paramount influence on the direction in which the birds turned at the coast, then one might expect flocks reaching the north coast of North Devon to turn west, and flocks reaching the west coast of North Devon to turn north, as being in both cases nearer to their standard direction (W.N.W.) than the opposite direction along the coast. If, when these birds reached Bull Point, conditions still deterred them from putting out to sea, they would then, presumably, turn and continue coasting past each other, in opposite directions. For all these conditions to be met might be rare, and Bannerman's records show that such two-way coasting is at least unusual. On 8th November 1944, there was a light east wind (which might have little influence on the direction of coasting), slight rain and falling pressure (which might be favourable for movement over the land but not out to sea); but further records are needed to determine whether my highly tentative explanation is correct. On this view, although there were two coasting movements in opposite directions, both were derived from the same main migration, W.N.W. to Ireland.

#### SEAWARD DEPARTURES

With a light wind most of the Chaffinches reaching Bull Point set out to sea, though some turned and coasted, while with a moderate wind most turned and coasted. This was particularly striking on 28th October, when the wind lightened during the second hour of the movement, and also in a comparison of 21st with 22nd October (see earlier). There also seemed to be a tendency for those flocks reaching Bull Point travelling higher to set out to sea, and for those travelling lower to turn and coast, as reported in Holland by Klomp (1956), but I did not make precise measurements, and there were certainly some exceptions, which depended partly on the strength of the wind at the time. My earlier suggestion (Laek, 1954) that Chaffinches typically set out to sea at a great height was in part confirmed, since some left at the limit of visibility upwards through 12× field-glasses, and others were rising above this limit when lost to sight. This raises the possibility that others may have been travelling too high to be seen at all from Bull Point. Other flocks, however, set out from Bull Point only a few hundred feet above the water, especially at certain times, and though some of these were rising when last seen, others did not appear to be.

Another suggestion made earlier (Laek, 1952), that Chaffinches



set out to sea chiefly in the first few minutes after dawn, is wrong, observations at Bull Point showing, instead, that the birds are likely to set out at any time during which the main coasting movement continues (see particularly 28th October). Dutch workers have found that a smaller proportion put out to sea later in the day, but at Bull Point hardly any Chaffinches passed later in the day.

Most seaward-going flocks headed out W.N.W., apparently quite uninfluenced by the distant land in full view, Lundy due west and South Wales extending between N.E. and N.W. The greater variations in the direction of departure on 28th October (which also held for Starlings on the same day—see below) have not been explained.

#### OTHER SPECIES

Bramblings (*Fringilla montifringilla*) called so often from the passing flocks of Chaffinches on 22nd October that hundreds must have passed on this day, and some were heard every day. They travelled in mixed flocks with the Chaffinches and behaved in the same ways. Three coasting parties of Greenfinches (*Chloris chloris*) and two of Goldfinches (*Carduelis carduelis*) also appeared to be migrants, but the few parties of Linnets (*C. cannabina*) were probably local. For specific determinations in the finch flocks, it would be better to watch on the north coast, where many coasting birds fly below the observer, rather than at Bull Point, where almost all pass overhead.

Starlings (*Sturnus vulgaris*) put out to sea from Bull Point in large flocks, but, as at the Land's End, very few coasted. They came to the coast from inland, then usually rose and bunched tightly, sometimes retreated and returned, and then set out, travelling high and changing into extended formation over the sea. Occasionally some members of the flock broke away, sometimes when a long way out, and returned to the land. The main direction was N.W., i.e. rather more northerly than the Chaffinches, but on 26th and 28th October, many went north and a few N.N.E., and on 28th October a few others left west. In the first hour of the watch 740 passed on 22nd October and 1,450 on 26th October. On 28th October there was 900 in the first, 1,425 in the second, and 3,030 in the third hour of the passage (starting at 7.10 a.m.) and 330 passed during 11.50 a.m.-12.50 p.m. In general, Starlings tended to move rather later in the morning than Chaffinches, which were always most numerous in the first hour of the passage. The Starlings were also less deterred than Chaffinches by strong winds, a few flocks putting out to sea on the days when no Chaffinches were moving on the coast.

With west and southwest winds, very few Skylarks (*Alauda arvensis*) were seen at Bull Point, the most being on 28th October, when 3 passed in the first, 27 in the second and 54 in the third hour of the watch from 7.10 a.m. Nearly all came from inland

and went out to sea N.W., a few left north and one party left west, and there was no appreciable coasting movement. On 27th October, with a N.E. wind, 322 came up from the south in the first hour, nearly all of which went out to sea due north, though one party left W.N.W. and another west, while some flocks turned east and coasted. Later in the morning, several flocks were seen coasting east in Hele Bay. On the same day, Skylarks were coasting north at Bude, Cornwall, 142 passing in one hour from 9.53 a.m. (H. G. Hurrell, *in litt.*). As always, those Skylarks setting out to sea came high over the land and then dropped low over the water, in marked contrast to the Chaffinches and Starlings, which rose, or stayed high, over the water. In addition, very small numbers of Skylarks were seen on most days coming in off the sea and proceeding inland just east of south. These presumably belonged to the other main movement of the species in October, which takes places south or S.S.E. (Snow, 1952).

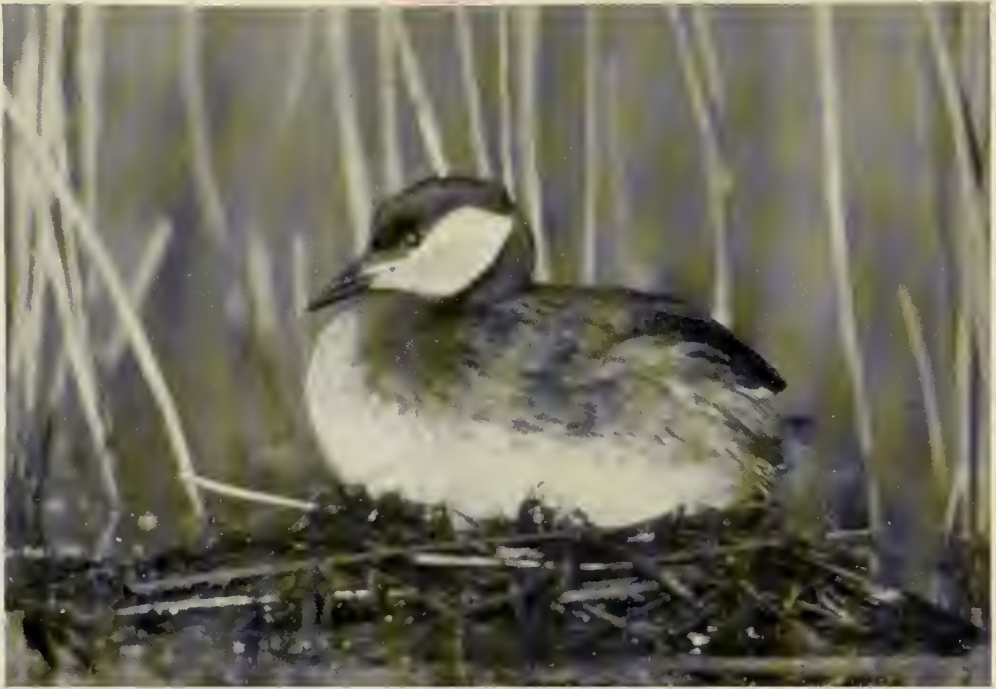
Two parties of 8 and 4 Meadow Pipits (*Anthus pratensis*) went out to sea N.N.; twice a Woodlark (*Lullula arborea*) and once a Pied Wagtail (*Motacilla alba*) were seen coasting.

200 Fieldfares (*Turdus pilaris*) passed high over Bull Point and put out to sea N.W. at 10.25 a.m. on 27th October. Earlier that morning, three parties of unidentified thrushes travelled east inland of Hele Bay, and later four Redwings (*T. musicus*) coasted north over Morte Point. Early on 28th October at Bull Point, six Redwings came in off the sea, travelling extremely high, and went on inland S.E.; perhaps they were part of an overlooked seaward party which broke back, as sometimes happened with Starlings. On 28th October at 9.20 a.m. 90 Lapwings (*Vanellus vanellus*) went out to sea N.N.W. Bull Point may well be a departure place for various other Irish migrants, but attention was concentrated on the Chaffinches.

#### ORIGIN AND DESTINATION OF THE MIGRANTS

It is reasonable to suppose that nearly, if not quite, all the migrants that put out to sea from Bull Point on a bearing between west and N.W. are destined for Ireland. They belong to species that are known to arrive in large numbers in Ireland for the winter. Some of them might, presumably, have originated from areas to the east, in Central Europe or possibly southern England, but some, and notably the Bramblings, have certainly come from northern Europe, and presumably this may also apply to the Chaffinches travelling with the Bramblings, also to the Starlings, Fieldfares and Lapwings. In any case, the Bramblings and Chaffinches heading out W.N.W. and the Starlings and Skylarks heading out N.W. or even north, from Bull Point, have presumably changed the standard direction of their migration at some point further back on their journey, from south-westward to north-westward.

The places where this postulated change occurs would repay study. The apparent scarcity of migrating Chaffinches in the



*Ilse Makatsch*

RED-NECKED GREBE (*Podiceps griseigena*) AT NEST: AUSTRIA, JUNE 1952

These photographs show the distribution of colours on the head and neck: the black cap, the clear grey cheeks bordered with white, and the rich chestnut of neck and upper breast which gives the bird its name. Compared with a Great Crested Grebe (*P. cristatus*), this is a smaller and more thickset species, with a shorter, stouter neck and a bigger, more rounded head (see page 24).





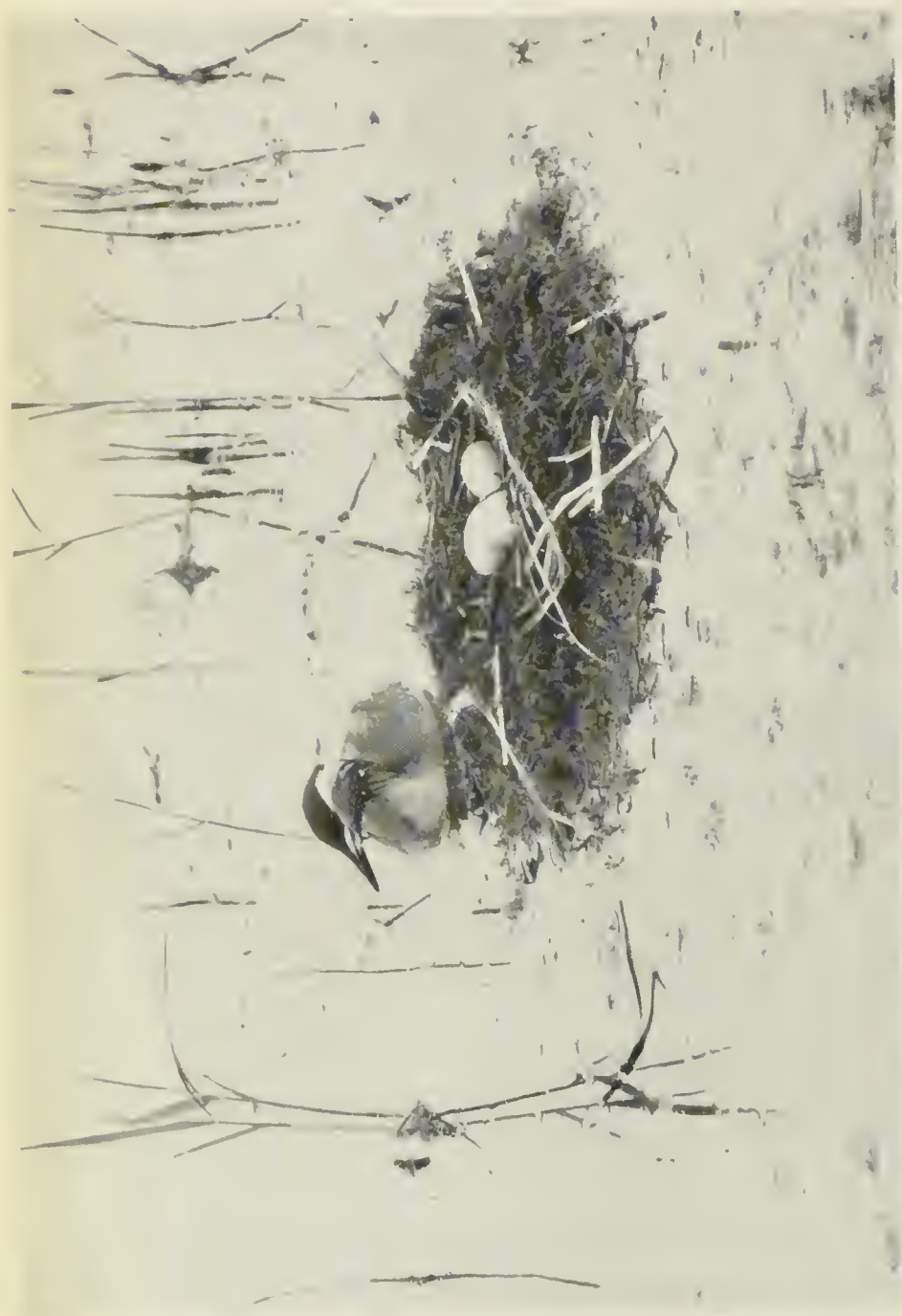
M. D. England

HABITAT OF RED-NECKED GREBE (*Podiceps grisegena*): BYGHOLMSVEJLE, DENMARK, JUNE 1950  
 The nest is shown in the centre of the picture and the hide from which Messrs. Doncaster's and England's photographs were taken can be seen in the foreground. As with other grebes, the breeding-habitat varies from quite small ponds to vast meres or lakes, but on the whole the proximity of good cover seems to be more important that it does with the Great Crested (*P. cristatus*) (see page 23).



M. D. England

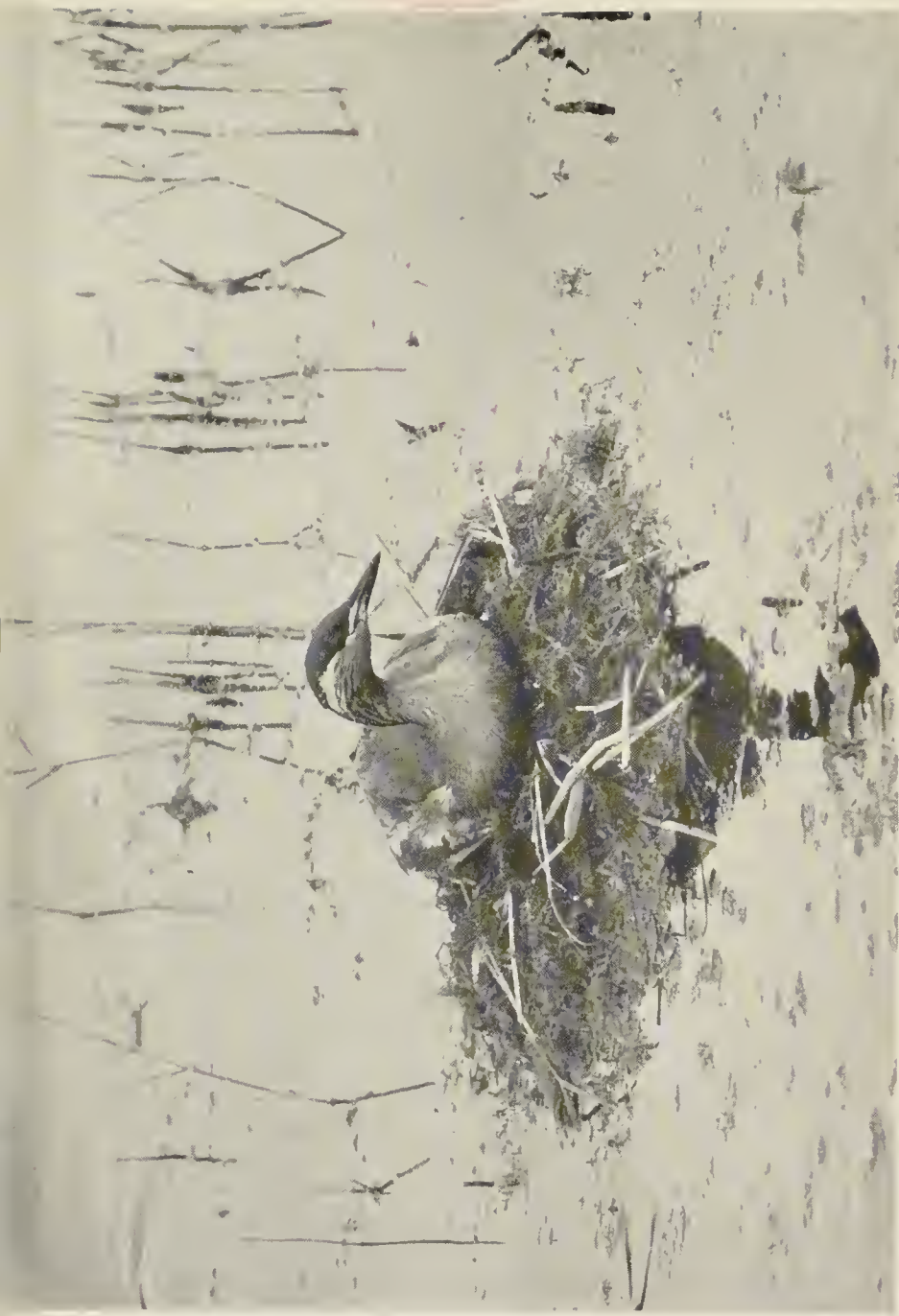
RED-NECKED GREBE (*Podiceps grisegena*) ON NEST: BYGHOLMSVEJLE, DENMARK, JUNE 1956  
 As with other grebes, both sexes incubate and this bird was thought to be the male. The rest of the photographs at this site are of the presumed female. Here, in addition to the head-pattern, one gets a good idea of the distinctive yellow at the base of the black bill and the two tufts of elongated feathers on the sides of the crown which, when raised like this, form two black humps (see page 24).



M. D. England

RED-NECKED GREBE (*Podiceps grisegena*) BY NEST: BYGHOLMSVEJLE, DENMARK, JUNE 1956  
 It will be seen at once that this bird appears to have a head-pattern different from those in the preceding plates. This is, however, simply the effect of wet plumage after diving and—compare the same bird in plates 5, 6 and 7—gradually the water dries to leave the normal pattern. The chalky, quickly-stained eggs, ovoid in shape, are much like those of other grebes, and 4-5 would be a far more usual clutch.





M. D. England

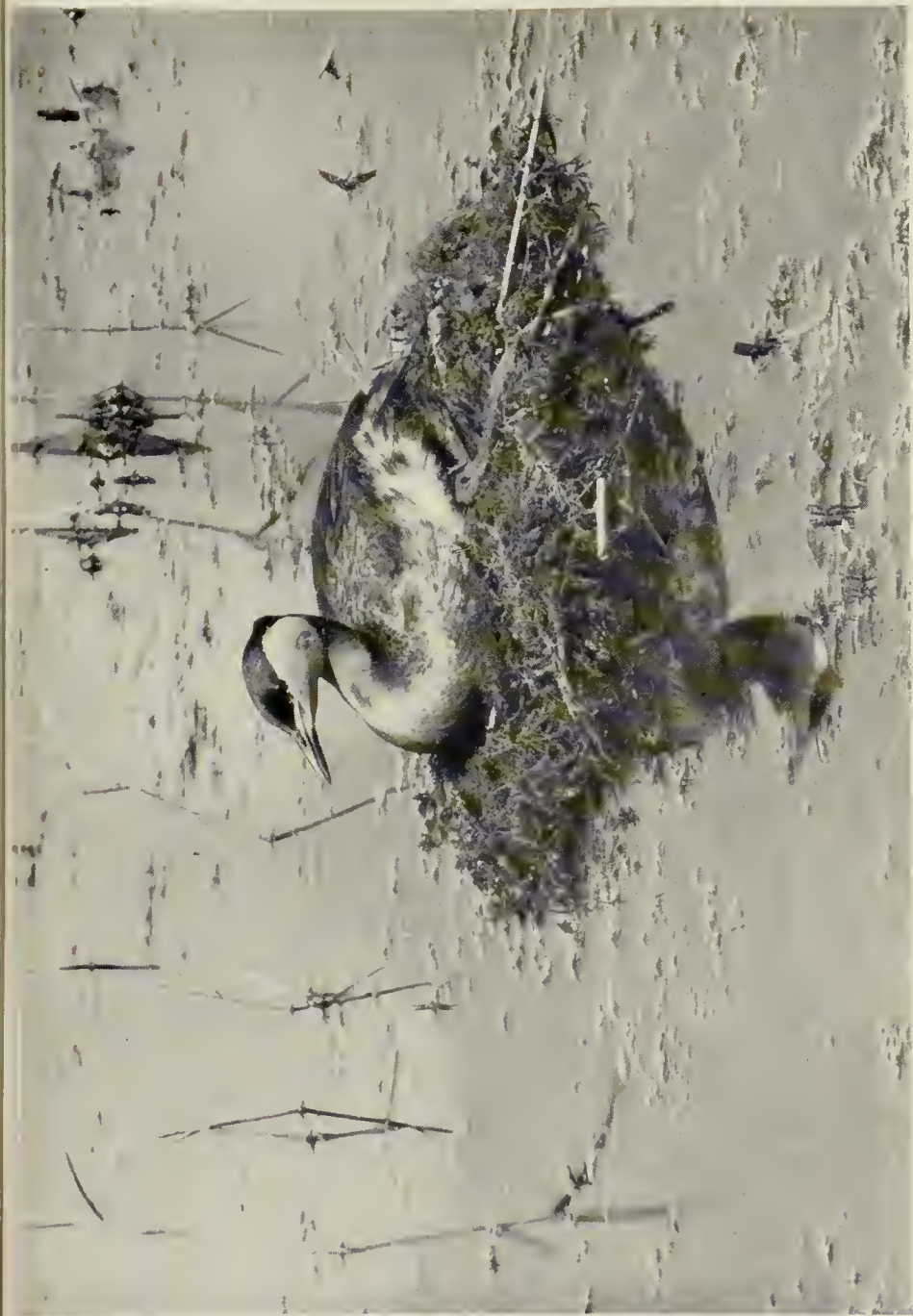
RED-NECKED GREBE (*Podiceps grisegena*) ON NEST: BYGHOLMSVEJLE, DENMARK, JUNE 1956  
 This again shows the bird with wet plumage: in this state the gray of the cheeks becomes darker, and appears as if marked with black streaks extending down the sides of the neck. This bird is the presumed female and, though there is no standard difference between the sexes, was separable from the other by the dark line crossing the yellow on the lower mandible (cf. plate 3, and see page 24).



C. C. Doncaster

RED-NECKED GREBE (*Podiceps grisegena*) ON NEST: BYGHOLMSVEJLE, DENMARK, JUNE 1956  
The plumage is here dryer than in the preceding photographs, but the cheeks are still rather streaky and the white border ill-defined. Like those of other grebes, the nest may be out in the open, as here, or well in a patch of reeds, as in plate 1. Always, however, it is the characteristic heap of decaying aquatic vegetation and usually built up in fairly shallow water not far from land.





C. C. Doncaster

RED-NECKED GREBE (*Podiceps grisegena*) ON NEST: BYGHOLMSVEJLE, DENMARK, JUNE 1956  
This is the same individual, but the plumage is now completely dry and shows the typical pattern. The body is darker above than a Great Crested's (*P. cristatus*) and the white flanks are mottled with brown. A comparison between this plate and the one opposite shows how the loose nest-material may be moved from one side to the other, particularly as a result of the bird's covering its eggs on leaving them (see page 24).



*Ilse Makatsch*

BLACK-NECKED GREBE (*Podiceps nigricollis*) ON NEST: AUSTRIA, JUNE 1952

This is perhaps the most attractive of the grebes with its high crown, and its completely black head and neck relieved only by the bright pink eyes and the fan of golden feathers on either side of the head—which distinguish it from the usually flatter-crowned, chestnut-necked Slavonian Grebe (*P. auritus*) with its gold stripe through the eye. Note also the slightly tip-tilted bill (see page 25).



Land's End as compared with North Devon, already mentioned, and the arrival of Chaffinches in late October on the south coast of England at least as far west as Portland Bill, suggest that these birds, and the associated Bramblings, may change their direction on the Continent, before leaving for England. On the other hand, if the comparative scarcity of migrant Skylarks in North Devon in October 1956 is typical (there were many more in the Land's End in 1951), these birds perhaps change their direction in southern England. To investigate this problem further, more observations are needed of the extent to which the species studied here arrive on the south coast of England travelling north-westwards and on the east coast travelling south-westwards, and also of the standard directions of these species where their migration is undeflected in central and southern England.

## SUMMARY

1. In late October, thousands of Chaffinches set off out to sea, chiefly W.N.W., from Bull Point on the "corner" of North Devon, heading for Ireland.

2. Others travelling with them tend, with the prevailing S.W. winds, to coast west along the north coast and then to turn south along the west coast. But with north-easterly winds they tend to coast north along the west coast and then to turn east along the north coast. The continuation of these coasting movements south and east respectively, away from the standard direction towards Ireland, is attributable to the change in direction of the coast at Bull Point. On at least one occasion, both streams have been seen passing in opposite directions simultaneously.

3. Many Starlings, some Skylarks, Bramblings and a few other species put out to sea N.W. from Bull Point.

4. At least some of these species change their standard direction of migration from south-west to north-west either on the Continent or in southern England.

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# D.D.T. POISONING OF BIRDS

By VICTOR A. D. SALES

## INTRODUCTION

DURING the past 3 years an average of two visits weekly have been made to a small experimental agricultural nursery of  $6\frac{1}{4}$  acres in Ahmadi, Kuwait, Persian Gulf. A brief outline of the methods of cultivation and of the labour employed in this nursery might help a comparison with the practices in the United Kingdom.

(1) The nursery is surrounded mainly by tamarisk and prosopis trees to form a wind-break, and by these trees is roughly divided into six sections; two being planted with flowers and shrubs and the remainder with vegetables.

(2) The method of vegetable cultivation is in beds roughly  $5 \times 10$  feet separated at the sides by a ridge 12-15 inches wide, at the ends by a ridge 15 inches wide, an irrigation channel 15 inches wide and a path 30 inches wide. A few beds may be smaller but not less than  $5 \times 6$  feet, whilst those for tomato cultivation are long narrow beds 2 feet wide and 12-18 feet long. The irrigation channels serve rows of between 8 and 16 beds, with the exception of the tomato beds which may overflow into each other or are arranged each side of an irrigation channel. The method of irrigation is to allow the water to flood each bed in turn by the entrance to the bed being either closed or opened with a spadeful of soil that blocks it or the irrigation channel. Most vegetables are planted directly in the beds, but brassica are transplanted from seed beds 18-24 inches apart along the irrigation channels and around the edges of the vegetable beds.

(3) The labour is local with a foreman in charge and is supervised by an Indian.

From my observations it appears that the general application to the beds has been heavy-handed, whether it has been of seeds, manure, insecticides or any other substance, the principle appearing to be: "If a little is beneficial, a much greater amount must be increasingly so".

## THE BEHAVIOUR OF THE BIRDS

On 28th November 1955 at 0910 hours (local time) a White Wagtail (*Motacilla alba alba*) was seen to have a general tremor, wings quivering and slightly raised from the body, tail depressed so that the tips touched the ground causing it to spread somewhat like a fan; the legs were splayed outwards and the whole body except the head was subject to this tremor, so much so that it caused an involuntary forward movement until the bird reached the edge of a vegetable bed into which it fell—a distance of approximately 9 inches was covered this way. The bird regained its feet, then almost lay upon the ground with the tremor persisting. On my approaching the bird it did not take wing until I was within 3-4 feet of it, when it flew a few yards rising to a height of 4-5 feet at which it called and then fluttered to the ground, landing heavily. For a few seconds the tremor was absent but it commenced again as the bird tried to stand. It was only after



several attempts that I succeeded in catching it: each time it waited until I was within a foot or two before rising a few feet in a fluttering manner, calling at its greatest height before returning to the ground and landing heavily. On two occasions during these flights another White Wagtail flew at it in an apparently aggressive manner and alighted near it when it landed, my close proximity then causing the second bird to fly away.

When finally it was captured, I noted that in the hand the general tremor persisted and the legs and feet appeared to be flaccid or partially paralysed. Only once, when it was first caught, did the bird make any attempt to peck, and it made no great effort to escape. During the time it was held (approximately 40 minutes) it caught and ate 6 House-flies (*Musca domestica*) that were crawling over my hands, but later the flies crawled over its head and until they reached its eyes it took no notice of them at all.

Though the tremors persisted, the bird was eventually released and it then again flew a few yards before crash-landing, where it remained with the tremors continuing and very little apparent use of its legs.

Twenty minutes later, as its condition stayed the same it was recaptured and kept under observation from then onwards until it suddenly expired at about 1040 hours (see below). During this time there was little change in its condition, though with its legs splayed outwards and the proximal end of the tarsus only  $\frac{1}{4}$ - $\frac{1}{2}$  inch off the ground it was able to support its body; the tremors were now a little less severe and did not cause any movement of the legs and only slightly so of the wings.

Just before 10.00 hours on the same day a Song Thrush (*Turdus philomelos*) was seen to have a similar tremor to that of the White Wagtail, but the feet and legs appeared much weaker and the bird had difficulty in standing, falling invariably onto its left side. Capturing the bird was not difficult as it flew up only twice for 2-3 yards at a height of 2 feet before crash-landing. In the hand the tremors appeared less severe than those of the wagtail and it made no attempt to struggle; when released it could hardly stand and fell forward onto its side on the several occasions it made the effort to try. Whilst in the hand the bird drank water which was offered to it in a saucer. Unfortunately I left both birds for a few minutes at 10.35 hours and when I returned they were dead, the wagtail on its back and the thrush on its side.

Earlier in the month birds of the same species and others had been observed feeding amongst eight beds of radish, each bed measuring 5 x 10 feet on which a 5% agricultural D.D.T. insecticide had been lightly applied. Their behaviour appeared quite normal and no ill effects were observed. A further application of the D.D.T. had been made to the same beds on the afternoon of 27th November, this application being so heavy as to make the ground almost entirely white; the quantity was estimated (from later experimenting, as no records were kept of the amounts of D.D.T. used) to be 3-4 pounds to each bed. The thrush was captured in one of these beds and was quite

white; the black bib of the wagtail was also covered with the powder.

At 09.05 hours on 7th December 1955 a Red-throated Pipit (*Anthus cervinus*) was observed to have a general tremor similar to those seen in the thrush and wagtail: the wings slightly raised away from the body and quivering, and the tail slightly spread with the tips pressed to the ground, which appeared to help a little to control the general tremor which affected the whole body except the head. The bird was able to fly much further than either the thrush or wagtail were seen to do and the tremors did not appear so great, but the tremor of the wings was apparent even in flight, giving an unusual fluttering effect. This bird was, as one might expect, more difficult to capture: it alighted better and always towards cover, prolonging its flight if necessary to reach it. After its capture, at 09.38 hours, the bird's condition did not alter greatly until 10.30 hours when the tremor increased slightly and involved the head; some paralysis of the legs, and especially of the feet, also became apparent. From then onwards it was for the most part kept lightly in the hand to control the tremor: this was successful except that the head maintained a regular forward and backward movement; the bird's condition appeared gradually to improve a little, its eyes and alertness were brighter, the tremors less, but the paralysis of the legs and feet remained and they could not carry the bird's weight. An attempt was made to immobilise the bird by lightly enclosing it in a handkerchief wrapped tube-like around it, but it managed to wriggle itself free and was discovered a few minutes later on its back with the general tremor more intense than previously and affecting the whole of the body; again this was controlled by the hand, when after a few minutes it almost ceased, but the paralysis of the legs and feet remained, the eyes lost a little of their brightness and 4-5 minutes later a more general weakness became apparent: within a few seconds the bird made an involuntary forward movement and life was extinct, the time being 11.56 hours.

This bird had been first observed in the nursery on 5th December 1955 and, though the D.D.T. had not been used generally over the crops, on the 6th approximately 4,060 newly transplanted brassica plants were heavily dusted with it; it was amongst these plants that the bird had been observed feeding.

During the past 3 years I have seen no similar behaviour of any other birds, nor have I observed D.D.T. applied so heavily as on 27th November and 6th December 1955. Though no pathological examination was made of the dead birds, the behaviour described above is known to resemble the effects of D.D.T. poisoning.

[It appears that excessive application of D.D.T. was probably responsible for this mortality. We would be glad to receive any records of casualties among wild birds apparently due to chemical spraying or dusting. Such records should state the nature of the chemical and the dosage applied, the weather conditions, previous treatment of the site, and other relevant background information. —Eds.]

# PHOTOGRAPHIC STUDIES OF SOME LESS FAMILIAR BIRDS

## LXXVII. RED-NECKED AND BLACK-NECKED GREBES

Photographed by C. C. DONCASTER, M. D. ENGLAND and  
ILSE MAKATSCH

(Plates 1-8)

THERE are some twenty species of grebes in the world, but the five that occur in Britain are the only ones in the Palaearctic. Of these, the Great Crested (*Podiceps cristatus*) and the Little (*P. ruficollis*) are comparable in their distribution, both being found in Europe, southern Asia, Africa and Australasia, while the other three—the Red-necked (*P. griseigena*), the Slavonian (*P. auritus*) and the Black-necked (*P. nigricollis*)—are confined to the northern hemisphere (including N. America), except that the last is locally distributed in East and South Africa as well. The Red-necked, which is no more than a winter-visitor to this country, breeds in the eastern half of Europe from Finland, Sweden, Denmark, Germany and the E. Balkans, east as far as the Caspian Sea and the River Ob in W. Siberia. The species is then missing from central Siberia, except for a few isolated pockets, and it is from the River Lena eastwards in N.E. Siberia, Kamchatka, eastern Mongolia, Manchuria and Sakhalin that it is again fairly widespread. These E. Asian birds (and the scattered communities of central Siberia as far west as Lake Balkash) are of the American race (*P. g. holboelli*) which otherwise extends from Alaska across Canada and the very northern edge of the United States to Labrador and New Brunswick.

Our plates were all taken in Denmark and Austria, which are thus at the western limits of the European range. Plate 2 gives a good impression of a breeding-habitat in Denmark and a comparison between the Danish nest and the Austrian one shown in plate 1 illustrates how, as with most grebes, the nest may be right out in the open or well buried in an extensive reed-patch. The habitat varies from quite small ponds to vast meres or lakes, but on the whole the *proximity* of good cover seems to be more of a necessity than it does with the Great Crested.

Plates 1 and 7 in particular give an excellent idea of the contrast between the black crown, the grey cheeks bordered with white, and the rich chestnut neck which gives the species its name. When it has recently been diving, or during rain, however, the bird tends to get a slightly less clear-cut appearance, and this is well shown by considering plates 4-7 inclusive. Though these were not taken in series, nor even on the same day, they do serve to illustrate the wet plumage and the process of drying out. When



the head is wet, the grey of the cheeks becomes darker and appears to be marked with black streaks which continue down the side of the neck. Plate 3 shows the shape of the tufts of elongated feathers on the sides of the crown which form two black humps when raised. Head-adornments are characteristic of many species of grebes, but these do not compare very favourably with, for example, the tufts and tippets of the Great Crested or the beautiful golden "fan" of the Black-necked (see plate 8).

Plates 3-7 all show the lemon-yellow base to the otherwise black bill, which is a useful field-mark at all times of the year, though in winter it becomes dulled and sometimes assumes quite a greenish tinge (while the tip becomes greyer or browner). Occasionally, as has been shown by D. D. Harber (*antea*, vol. xlvii, p. 169), the bill can be entirely yellow or almost completely so, even in winter.

The body-plumage is something like that of the Great Crested Grebe, but the present species is darker brown above and the silky-white of the under-parts is mottled with blackish-brown on the flanks and breast (plate 7). Thus, in winter, when all the contrasting colouring on the head and neck is lost, the Red-necked bears a certain resemblance to the Great Crested, but the front of the neck is usually shaded with brown—forming a shadow between the white areas of the throat and breast—though the colour and intensity can vary considerably from almost white to grey, brown and black. And as the cap becomes a hood that extends to eye-level (sometimes well below) and merges into the grey cheeks, the generally white-headed and white-fronted appearance of the Great Crested is completely absent. (Some Red-necks, perhaps first winter birds, are almost completely grey or brown and lack any clear-cut pattern.) Also, the Red-neck is smaller and darker, with a shorter and stouter neck. The head-shape, too, is characteristic. In proportion to that of the Great Crested, the Red-necked's is a bigger, more rounded head, sometimes slightly flattened on top, and—as has been pointed out by P. Géroutet (*Nos Oiseaux*, vol. xxiii, pp. 138-142)—it appears distinctively bulbous from the front or rear.

As can be seen in all these plates, the nest is the usual heap of decaying aquatic vegetation that is characteristic of the grebe family, and fresh weeds are always being added or existing material moved about (compare plates 6 and 7) in the covering and uncovering of the eggs when the bird leaves and returns (though both Red-necked and Black-necked Grebes are less prone to cover their eggs than either Great Crested or Little). The eggs, normally 4 or 5 in number, are a little smaller than those of the Great Crested, but are otherwise the typical ovoid shapes that start a chalky-white colour but gradually become more and more stained brown by the wet nest-material. Both sexes incubate: at the Danish nest shown in these photographs the two birds were separable by the shape of the yellow patch at the base of the bill, and plate 3 shows the presumed male on the eggs.



As a comparison, our last picture is of a Black-necked Grebe on its nest in Austria. Quite different from the Red-necked in many respects, and most like the Slavonian in shape and size as well as coloration, the Black-necked is perhaps the most attractive of the Palaearctic grebes—with its high forehead, and its completely black head and neck relieved only by bright pink eyes and the “fan” of golden feathers on either side of the head. These features distinguish it in the breeding-season from the usually flatter-crowned, chestnut-necked Slavonian Grebe with its gold stripe through the eye. This photograph also gives some indication of the Black-necked’s tip-tilted bill which is, however, a rather variable character depending, too, on the angle at which the bird is seen.

Both Red-necked and Black-necked Grebes are partial migrants and, although only the latter ever breeds in Britain and that quite rarely, the extension of range which takes place in winter brings them both regularly to this country, though chiefly to the east and south of England respectively. Grebes are chiefly night-migrants; therefore their arrivals and departures are unspectacular and one seldom sees the powerful flight of which they are, perhaps surprisingly it seems, capable. Occasionally, however, diurnal migration is visible and T. Anderson (*Vår Fågelvärld*, vol. 13, pp. 133-142) shows how, as in the cases of certain ducks, geese and auks, some part of the migration of Red-necked and Great Crested Grebes may be made by swimming during the day. Quoting observations made in 1949-53 on the Swedish coast, where he has watched these birds passing in autumn at an average of 2 kilometres an hour, between 50 and 200 metres off shore, he suggests that they “accomplish the greater part of their journey by nocturnal over-sea flights, to settle on the sea on the early morning and continue their migration at a slower pace.” I.J.F.-L.

## SONG-POSTS OF THE BLACKBIRD IN A BUILT-UP AREA

By DEREK C. HULME

IN the paper “Buildings as song-posts” (*antea*, vol. xlviii, pp. 211-215) I described and tabulated the perches used by nine species of birds in full song, that were seen along the two-mile route I cycled daily—apart from week-ends and holidays—between my home in suburban Littleover and workplace near Derby’s arterial road. This study was too exacting to repeat so, instead, in the following three years, I concentrated on a single species, the Blackbird (*Turdus merula*).

All singing Blackbirds, seen and unseen, were carefully recorded along the same route as on the 1952 counts. The song-posts of those seen were tabulated in three classes: building (of brick,

stone or concrete and including metal fixtures), artificial (all other man-made objects) and natural (trees, shrubs, hedges, and the ground) and their heights estimated in multiples of five feet. Perches of songsters hidden from view by buildings, trees after foliage and high hedges were classed as undetermined.

#### NUMBER OF COUNTS

In 1953 Blackbirds commenced singing along the route on 18th February and were last heard on 10th July. Within this period 352 counts were taken and no Blackbirds were in song on 147 of these counts. The number of records of Blackbirds in song totalled 619 and the perches on 405 occasions were located. The maximum number of songsters on any one count was 14 in the late afternoon of 18th June.

In 1954 song was heard between 17th February and 7th July, 382 counts were taken (150 negative) and of 494 records the perches of 316 were located. The maximum number of songsters was 8 on the evening count of 11th May and the late afternoon count of the 13th.

In 1955 song was heard between 2nd March and 22nd July, 351 counts were taken (119 negative) and of 574 records the perches of 360 were located. The maximum number of songsters was 10 on the evening counts of 12th and 24th May.

#### CLASSES OF SONG-POST USED

Table I shows the classes of song-post used in the three years, the results being expressed in percentages.

TABLE I—PERCENTAGES OF EACH CLASS OF SONG-POST USED BY BLACKBIRDS (*Turdus merula*)

	1953	1954	1955	3 years
Building	22	23	23	23
Artificial	13	6	6	8
Natural	30	35	34	33
Undetermined	35	36	37	36

The last column is calculated from the totals of actual numbers of records in the three years and is not the average of the three percentage figures (though as it happens in this case the results of both methods almost coincide).

If the song-posts not located are ignored the percentages of the 1952 counts can be utilized, as shown in Table II.

TABLE II—PERCENTAGE OF EACH CLASS OF SONG-POST USED DISREGARDING THOSE UNDETERMINED

	1952	1953	1954	1955	4 years
Building	34	34	36	36	35
Artificial	12	20	9	9	13
Natural	54	46	55	55	52

The results of the last two years agree very closely: the difference between 1955 and 1954 amounting to building nil, artificial minus .29% and natural plus .29%.

#### BUILDING SONG-POSTS

The buildings are mainly semi-detached and detached houses,

with fewer bungalows, built between the two world wars. A row of terraced houses skirts the route for about 200 yards. The few buildings with potential song-posts 35 or more feet above the ground include large, late nineteenth century houses, a church, a school, a public house, Normanton barracks and a modern bakery. The actual numbers of building song-posts used in three years are given in Table III.

TABLE III—NUMBERS OF BUILDING SONG-POSTS USED BY BLACKBIRDS  
(*Turdus merula*)

	1953	1954	1955
Gable-end ridge-tile	65	56	77
Other ridge-tiles	16	2	10
Hip ridge-tile	4	6	8
Chimney-pot	27	10	2
Chimney-stack	4	4	1
Gutter	10	20	22
Television aerial	5	7	9
Miscellaneous	7	9	2

The miscellaneous song-posts were the stone cross on the tower of a church (on 5 occasions in 1953), the stone façade of a shop (3 times) and of a hotel (once), the telephone insulator on the side of a house (twice), the flat top of the window bay of a house (once in two years), on the letter N of the weather-vane of a small branch bank, the dovecote-like tower of a shop, the doorway porch of a house, the soil pipe of a bungalow, the roof of a brick garage and the lightning conductor of a school.

Twenty of the 226 ridge-tile records were on bungalows, four of the chimney-stacks were without pots and 12 of the gutter records were on the metal scroll below the hip tiles and another one on the snow-board above the gutter.

It may be thought that the buildings were used by a few Black-birds in a restricted area but this was not the case. For example: the 65 gable-end ridge-tiles used in 1953 were on 40 houses and 9 bungalows fairly evenly distributed along the route.

One loudly singing Blackbird took about three minutes to locate—the bird was standing inside the trough of a house-guttering with only its head visible from the road! Another odd stance and incidentally the highest building song-post used in the three years was the vertical whip-like lightning conductor where the bird had to perch with one leg tucked in closely and the other fully extended.

The number of television aerial song-posts bears no relation to the tremendous increase in these objects through the seven years since they were first erected in Derby (see Table IV).

TABLE IV—TELEVISION AERIALS USED BY BLACKBIRDS (*Turdus merula*)

	1951	1952	1953	1954	1955
H-type	1	11	4	4	7
X-type	—	4	1	3	1
I-type	—	—	—	—	1
No. of houses	1	10	5	5	6



The horizontal bracket of the dipole (I-type in Table IV) was used. The Band III aerals did not appear in the district until after the 1955 song-season.

#### ARTIFICIAL SONG-POSTS

There is a great variety in this class including posts and poles up to *ca.* 35 feet in height, garden sheds, overhead cables and wires, fences, brick and stone walls, street lamps, notice-boards and bill-hoardings. The actual numbers of artificial song-posts used in three years are given in Table V.

TABLE V—ARTIFICIAL SONG-POSTS USED BY BLACKBIRDS (*Turdus merula*)

	1953	1954	1955
Telegraph- and cable-post	41	16	3
Wireless and flag-pole	21	2	1
Low power cable	6	3	7
Wooden post and fence	3	4	9
Shed	4	4	10
Miscellaneous	6	—	2

The miscellaneous song-posts were a telephone wire (twice), a bill-hoarding (twice), the reflector cover of a lamp-standard, a brick wall, a wire fence and the surface of a tarmac road.

Some individual songsters favoured a particular pole, especially in 1953 when nine posts gave the 41 records and a Blackbird was seen 19 times on one wireless pole.

#### NATURAL SONG-POSTS

The broad-leaved trees are mainly ash, beech, elm, horse-chestnut, oak, poplar and fruit trees. A few specimens are over 45 feet high. Coniferous trees, mostly cypresses and Scots pine, are fewer and less high. Shrubs are abundant in the gardens. Privet and hawthorn are the chief hedging species. Phrases of song were frequently heard in flight across roads to song-posts. The actual numbers of natural song-posts used in three years are given in Table VI.

TABLE VI—NATURAL SONG-POSTS USED BY BLACKBIRDS (*Turdus merula*)

	1953	1954	1955
Broad-leaved tree or shrub	138	134	170
Coniferous tree	35	13	14
Hedge-top	7	13	7
Tree-stump	2	9	2
Ground	4	3	4

Only 80 of the 442 broad-leaved tree records referred to the topmost twig. Another 13 records referred to near the top of trees over 30 feet in height. In 1955 23 of the top-twig records referred to trees before foliage. Of the hedge-top records, 20 were on hawthorn, 6 on privet and one on laurel. The tree-stumps were between 5 and 10 feet high.

#### HEIGHTS OF SONG-POSTS

The heights of chimney-pots, ridge, gutter and other features



of a typical house and bungalow were measured (by holding up a clothes-prop while standing on a ladder) and the simple gable of some older houses was calculated from a count of bricks. Variations were judged from these known heights. The higher perches in trees were estimated from houses near-by. In a built-up residential area this method proved to be easier and more accurate than standing imaginary six-foot men on top of each other.

TABLE VII—HEIGHTS OF SONG-POSTS USED BY BLACKBIRDS (*Turdus merula*)

Height in feet	1953	1954	1955	Total
45-50	3	—	2	5
40 +	1	3	4	8
35 +	28	2	9	39
30 +	11	13	4	28
25 +	147	96	106	349
*20-35	14	31	43	201
20 +	31	38	44	
15 +	86	52	67	205
10 +	47	29	36	112
5 +	26	38	26	90
0 +	6	11	15	32
0	5	3	4	12

\*The 20-35 foot heights in Tables VII refer to birds that were isolated to a particular tree but were singing hidden from view by foliage at a height above 20 feet and not higher than 35 feet above the ground. Probably on a number of these 88 occasions the bird was in the 25-30 foot range and maybe fewer others were in the leafy crown between 30 and 35 feet up. After making this adjustment to Table VII there still remains a 28% drop in records between the 25 + and 30 + ranges.

The weather was noted on each count. Though inclement conditions reduced the number of songsters (often to nil even on May evenings) no significant effect of bad weather on the type or height of song-posts is apparent from my charts (e.g., ridge-tiles were used in moderate rain or force 5 winds).

TABLE VIII—HEIGHTS OF SONG-POSTS USED IN THE THREE CLASSES IN 1955

Height in feet	Building	Artificial	Natural
45-50	—	—	2
40 +	—	—	4
35 +	1	—	8
30 +	—	—	4
25 +	86	—	20
20 +	16	3	68*
15 +	26	11	30
10 +	1	3	32
5 +	1	7	18
0 +	—	8	7
0	—	—	4

\*This number includes the 43 records between 20 and 35 feet (see Table VII).

In 1955 the heights were also segregated into the three classes. Table VIII shows well that the building perches are practically confined to between 15 and 30 feet, which range includes all roof

perches from the gutter to chimney-pot or television aerial on the average house of the district. The other artificial perches are relatively lower in this particular year and due, no doubt, to their nature—many being single-perch song-posts—show no marked choice of height. Most records of the natural stations occur in the 10-30 foot range.

TIME OF DAY

The morning counts were taken between 06.15 and 08.30 G.M.T.; the mid-day counts, between 11.00 and 13.30 and the late afternoon or evening counts, between 16.30 and 20.00. I had little time to look for hidden songsters on the mid-day counts but had a few spare minutes in the mornings and the afternoon counts were taken at leisure (these facts are reflected in the bottom line of Table IX). I have included this table to show an interesting fact for which I can offer no explanation: building stances were least favoured at mid-day.

TABLE IX—TIME OF DAY

	1953			1954			1955		
	Morn.	Mid.	Aft.	Morn.	Mid.	Aft.	Morn.	Mid.	Aft.
Number of counts	98	178	76	102	193	87	97	178	76
% Negative	54	43	20	46	45	20	40	37	20
Birds in song	93	282	244	92	206	196	112	269	193
% Building	28	18	29	37	14	26	33	19	23
% Artificial	18	13	34	8	3	8	5	5	6
% Natural	22	29	12	28	38	35	27	35	38
% Undetermined	32	40	25	27	45	31	35	41	33

SUMMARY

1. The song-posts of Blackbirds along a two-mile built-up route in Derbyshire were noted in four years. If the songsters hidden from view are disregarded it was found that 52% used natural, 35% building and 13% all other artificial perches. A series of tables shows the actual number of each song-post in these classes used in three years.
2. Records of perches on broad-leaved trees or shrubs were the most numerous of all song-posts. The most popular building song-post remained as established in an earlier paper—namely, the gable-end ridge-tile of houses, followed by the gutter and the chimney-pot. The television aerial has not increased in popularity and buildings were least favoured by the mid-day songsters. The most used artificial song-post was the telegraph- or cable-post in two of the years.
3. All the building and the majority of the artificial song-posts were in exposed positions, but 20% of the broad-leaved tree or shrub records were of birds hidden amongst foliage and only 18% of the remainder referred to the topmost twig. The heights used ranged from ground-level to nearly 50 feet, *ca.* 67% of the records being between 15 and 30 feet above ground.

## NOTES

**Group-display of Smews.**—On 5th February 1956, at Swithland Reservoir, Leicestershire, I watched a form of social display in a group of Smews (*Mergus albellus*) consisting of three males and two females, for a period of about half an hour, just before dusk. The birds were swimming along the edge of the ice which covered about half the reservoir and were behaving in the most excited way, swimming about one another in swift little dashes. The two females were displaying by jerking their heads upwards and forward, so that the bills described a circular movement, ending by pointing downwards towards the water. The display seemed to be directed indiscriminately at the three males, whose rôle seemed to be passive except for the excited swimming which had the effect of maintaining close integration in the group. Periodically a displaying female would "attack" a male by swimming at him with her head and neck stretched almost along the surface of the water, her feet splashing water up behind. The attacked male would evade the female by half-swimming, half-flying in front of her for a yard or two. Occasionally the pursued male would break into flight, and immediately the remaining birds, with a reaction so rapid as to make the action appear instantaneous, would fly up as a group to land a few yards further on. Displays would then be resumed. My last glimpse of the birds before darkness made further observation impossible showed the behaviour still in progress. Display in Smews has been described in *British Birds*, vol. xxxi, pp. 106-111 and 151-153, but the above group-display contains elements not there dealt with.

R. A. O. HICKLING

**Alarm-note of Whimbrel.**—On the evening of 27th May 1956, my approach flushed a flock of Oystercatchers (*Haematopus ostralegus*) from a gravel bank beside a lagoon on the Dale Estuary, Pembrokeshire. With them was a bird which uttered a rather harsh and slightly guttural alarm-note with a faint nasal twang, "hah-hah" [the nearest familiar note is the Bar-tailed Godwit's (*Limosa lapponica*) "yak-yak"]. It flew round for several minutes, frequently repeating this alarm-note. A Whimbrel (*Numenius phaeopus*) then rose from another part of the lagoon and uttered the same note twice, followed without pause by the normal rippling whinny, and it was now evident that the first bird was also a Whimbrel. The note it uttered must be the "gück, gück" of Naumann quoted in *The Handbook*. From the time the first Whimbrel attracted my attention I was reminded of a harsh, chattering call I had heard uttered by one of two Whimbrels on passage, answered with the usual whinny by the other, in June 1948 (*antea*, vol. xlii, p. 92). On that occasion the timing and rhythm of the harsh chatter were the same as in the normal liquid whinny: it now becomes clear that it was a modification of the alarm-note, but it was definitely used as a contact call.

T. A. W. DAVIS



**Avocets in Derbyshire.**—Five Avocets (*Recurvirostra avosetta*) were found at Egginton sewage-farm, 5 miles S.W. of Derby, at mid-day on 6th September 1956, by C. Eric Brown and R.H.A. In the afternoon and evening the birds were seen by W. K. Marshall, S. Whitaker, S. G. Perry, F. Price, D.C.H. and other ornithologists. The Avocets, all in adult plumage, skimmed and up-ended at two pools in a weed-free portion of an unfenced field and permitted approach to within twenty yards. One frequently fed alone and also separated from the other four in brief flights. The following morning, at 06.15 G.M.T., W. J. Milne, R.H.A. and Mrs. D. C. H. found only one Avocet on the sewage-farm, half-a-mile from the earlier feeding-place; and this bird was last seen in the early evening of 9th September by S. Whitaker.

This is the first Avocet record for Derbyshire, at least during this century.

R. H. APPLEBY and D. C. HULME

[Inland records of Avocets are very rare and usually concern single birds. For Derbyshire, as Mr. Hulme has pointed out to us, F. B. Whitlock in *The Birds of Derbyshire* (1893) and F. C. R. Jourdain in *Victoria History of the County of Derbyshire* (1905) quote four records of single Avocets between 1800 and 1859, which may or may not apply to that county; in each case the details of locality are vague and may well refer to places just over the borders of neighbouring counties.—EDS.]

**Aggressive behaviour of Common Sandpiper.**—The *Handbook* (Vol. IV, pp. 298-299) gives no details of the aggressive behaviour or display of the Common Sandpiper (*Tringa hypoleucos*), and the following observation therefore appears worthy of being placed on record.

On 12th May 1956, at Old Parkbury, Radlett, Hertfordshire, I had under observation a pair of this species which were known to be mated, the typical sexual display and coition having been witnessed some days previously. This pair eventually bred successfully. At the time of observation both birds were feeding about twenty feet apart by the water's edge, on an island of gravel in a flooded pit. A third bird, evidently a male, suddenly flew down and landed close to one of the pair (presumably the female) and immediately started displaying by running backwards and forwards in front of her, with his wings raised vertically above his back, and uttering the normal song. The paired female ceased feeding, but otherwise ignored this display. The paired male, however, immediately rushed forward and chased the displaying male to the top of the mound of gravel. A fight thereupon commenced, which lasted for about fifteen minutes. This consisted of the participants facing each other with wings raised vertically above their backs, and then leaping furiously up and down and from side to side, much in the manner of squabbling Starlings (*Sturnus vulgaris*), at the same time uttering a loud note which I rendered as "kitti-kitti-kitti-kitti", rapidly repeated.



Eventually the mated male succeeded in leaping on to his opponent's back and began to peck viciously at the back of his head. Both combatants finally rolled down the slope into the water where the mated male retained his superior position and commenced to force the other's head beneath the surface of the water. The intruder managed to struggle free and flew off, pursued for a short distance by the victor. The latter quickly returned to the female whom he then chased for some moments with wings raised vertically. Finally, both birds recommenced normal feeding and nothing further was seen of the third bird.

BRYAN L. SAGE

**Shags drying wings on water.**— Notes on the subject of Cormorants and Shags (*Phalacrocorax carbo* and *aristotelis*) drying their wings while on the water (*antea*, vol. xlii, p. 250; vol. xliii, p. 159 and p. 378) refer to cases of single birds resting or swimming on a generally calm surface. On 30th September 1956, at Pittenweem, Fifeshire, I observed that in a raft of about 400 Shags some 50 yards off-shore on a rough sea (the wind had been blowing along-shore at force 5-6 for at least 2 days), *ca.* 20 Shags had their wings extended in drying attitudes. Other Shags chose an adjacent rock as a vantage-point for wing-drying. C. H. FRY

## REVIEW

BIRD RECOGNITION, 3. By JAMES FISHER (*Pelican Books*, London, 1955). 3s. 6d.

THIS is the third in an excellent series eventually to total four volumes covering all but the rarer birds on the British list. The birds included here are the rails, game-birds, and larger perching and singing birds, and among the species omitted on account of rarity are Nutcracker, Alpine Swift and Woodchat Shrike. The book follows the pattern of the two earlier volumes, and consists roughly speaking of a page of text for each species, facing a page containing a drawing, a distribution map and year-cycle chart; there are also habitat keys and field-character keys at the beginning of the book. The year-cycle charts are largely self-explanatory and the same applies to most of the maps, but those, for example, of the Chough, Raven and Black Redstart may be rather misleading or seem to be in disagreement with the text, without the explanatory keys which have appeared only in volume 1.

I like the extra information which is given beyond what might reasonably be expected in a condensation of this kind; thus, for a number of species which have increased or decreased their range markedly, there are 2 maps to show the changed situation. Distribution abroad is stated in some detail, with an indication of winter-range. Displays are mentioned, and the brief descriptions of general actions and habits are very apt. An unusual feature is the inclusion of the weights of birds, but it is clearly a misprint

to give the weight of a Nightingale as 8ozs. The text contains more information than many considerably more expensive books.

"Fish-hawk" has the unenviable task of producing an identification drawing of each species without the aid of colour. He is generally successful although his Nightingale might well defeat many who know the bird.

P.A.D.H.

## LETTERS

### "ATMOSPHERIC TURBULENCE AND BIRD FLIGHT"

SIRS,—In his letter on the above subject (*antea*, vol. xlviii, pp. 557-559) I. C. T. Nisbet puts forward an ingenious theory of wind-determination by feel. While agreeing that it is possible, I also consider that the conclusions drawn from it do not necessarily follow and would like to make a few comments.

(1) Reluctance to fly in high winds may be due to instability, but danger exists only when near the ground or sea and therefore mainly during take off or landing; a minimum height could therefore be proposed rather than the minimum safe flying-speed suggested. It is interesting to note in this connection observations that some birds fly higher when migrating down-wind than when flying up-wind. However, high winds also mean heavy up-wind going if no ground is to be lost, and this must also be a large contributory factor to reluctance to fly. That birds are aware of this may be seen in their use of the boundary layer of the first few feet above the surface during high winds. Presumably, therefore, birds which fly under such conditions have the necessary minimum speed-requirement or else are capable of the rapid control movements necessary to combat instability.

(2) As birds, or anything else, must spend more time flying up-wind than down if loss of contact with a certain area is to be avoided, it surely is not surprising that many more observations are made of up-wind rather than down-wind flight. One soon learns to fly up-wind for a longer time than down-wind for the reason that one gets lost far less easily, and this must stand a good chance of being innate behaviour as far as migratory birds are concerned. I should hesitate therefore to name instability as being the main reason for turning into wind when reaching a guiding line.

(3) It is suggested that, if visual determination is the only available means of finding out wind-direction, then the migrational drift hypothesis is impossible. I disagree completely with this conclusion as it is a matter of degree of visibility rather than a complete black-out. Williamson (*Scottish Naturalist*, vol. 64, 1-18) states—"On the darkest night a low-flying migrant would have no difficulty in determining, from observation of the waves, the direction in which its flight made the greatest headway", and I am of the opinion that this is nearer the truth than the suggestion that a bird makes an analysis of the gusts under such circumstances.

However, it may be appropriate at this point to query the hypothesis that the bird has left the shore before it loses its orientation and submit for consideration another conception.

If Matthews's theory of navigation is correct, the loss of the sun-star arc is not the only loss which can cause disorientation. Upsetting of the bird's time-sense is equally effective. I find it not improbable to think that, after migrating considerable distances into surroundings which are completely unfamiliar and possibly inimical, some birds will not have corrected their chronometer as easily as others and, in fact, might have lost it entirely if unable to observe sun or star arcs, sunrise or sunset, etc. In these circumstances such birds are completely lost and if still under the urge to fly would choose a course at random—some cross-, some up- and some down-wind.

Observation has proved beyond doubt that numbers of migrants have arrived down-wind. Is it not possible that these are the birds who, in their random choice, have flown down-wind by intention? Such birds hardly deserve the nomenclature of drift-migrants. They are random down-wind migrants and should not be confused with the true drift-migrant which has been blown to one side of its standard direction.

G. H. FORSTER

#### BIRDS' METHODS OF ESTIMATING FLIGHT-SPEED

SIRS,—In connection with Mr. I. C. T. Nisbet's letter on "Atmospheric turbulence and bird flight" (*antea*, vol. xlviii, pp. 557-559), the following may be of interest.

Flocks of Rooks (*Corvus frugilegus*) and Jackdaws (*C. monedula*), when making cross-country non-migratory flights, e.g., from rookery to roost, probably use ground observation to estimate their speed. When travelling down-wind, if the wind-velocity is fairly high, they first rise to a height of perhaps 200-300 feet, sufficient to clear ground obstructions such as trees and buildings, and in this area (Truro, Cornwall) sufficient to make their destination visible from the start.

Then they turn and travel down-wind for a distance which is variable. As each part of the strung-out flock reaches about the same point, or perhaps the same ground-speed, they turn into the wind, the ground-speed is reduced to nil or nearly so, and then they turn down-wind to repeat the process after travelling a similar distance. The air-conditions throughout the whole length of the flight which may cover several miles would be the same, and it is difficult to imagine some change recurring at intervals which could cause them to react in this way except the recurring increase in their ground-speed.

The action is, of course, very like that of a bird travelling down-wind and then turning into the wind to reduce its ground-speed for landing. It is interesting that although the coordinated movements which make up flight are inborn, and do not have to be learned, the judgment of ground-speed improves very much with



practice. Young birds may occasionally attempt to land downwind, or make their pre-landing turn far too late and be carried past the point in a tree-top for which they were obviously aiming. This is rarely done by an adult.

While Mr. Nisbet may be right that birds could judge their speed from variations in the air-conditions of their own immediate surroundings, in the instance that I have given it seems more probable that they watch the ground, and turn and arrest their progress as soon as their speed in relation to the ground gets higher than they like.

C. J. F. COOMBS

[We would welcome more observations on such behaviour, but we cannot accept the interpretation put forward here.—EDS.]

### “DUNNOCK” AND “HEDGE SPARROW”

SIRS,—I am sure that the sentiment expressed in your Editorial on the scientific and English names of birds (*antea*, pp. 1-5) will be generally approved—that English names of birds should be allowed to evolve with the English language. May I point out that the adoption by *British Birds* of the term “Dunnoek” for “Hedge Sparrow” conflicts with this principle? There is, however, an allied and no less important argument against the artificial introduction of dialect words into ornithological literature. The geographical distribution of such terms is of importance in folklore and philology but very little work has yet been done on mapping the areas in which they are, or have been, used. The adoption of a dialect term in place of an established name by a scientific journal is akin to the introduction of an animal or plant into new habitats so that its natural distribution is obscured. These considerations, together with those I put forward in *British Birds* (vol. xlv, p. 424) and *The Times* (24/xii/54), render undesirable the continuance of the use of the term “Dunnoek” in *British Birds*.

EDWARD A. ARMSTRONG

[Mr. Armstrong is wrong in suggesting that “Dunnoek” is only a dialect term rather than an established name. F. B. Kirkman and F. C. R. Jourdain, two of the most scholarly ornithologists of the first half of this century, used “Dunnoek” in their *British Birds* (1930). Raymond Irwin, the leading bibliographer of British ornithology uses it in his *British Bird Books: An Index to British Ornithology A.D. 1481 to 1948*. *The Manual of British Birds* by Howard Saunders revised by W. Eagle Clarke (1927), and T. A. Coward in his *Birds of the British Isles* (1920) use “Hedge Sparrow” but mention “Dunnoek” as being, in Coward’s words, “a widely used name”. (In addition, see the letters in *The Times* for 21, 22 and 23/xii/54.) These examples, which are far from exhaustive, amply justify current *British Birds* practice, which is to accept “Dunnoek” as a valid and preferable alternative to the misleading “Hedge Sparrow” which, however, may still be used by those who prefer it since, unlike Mr. Armstrong, we recognize that there are two sides to this question.—EDS.]

## NOTICE TO CONTRIBUTORS

*British Birds* publishes material dealing with original observations on the birds of Britain and Western Europe, or where appropriate, on birds of this area as observed in other parts of their range. Except for records of rarities, Papers and Notes are normally accepted only on condition that the material is not being offered to any other journal. Photographs (glossy prints showing good contrast) and sketches are welcomed. Proofs of all contributions accepted are sent to authors before publication. After publication 20 separates of Papers are sent free to authors; additional copies, for which a charge is made, can be provided if ordered when the proofs are returned.

Contributors are asked to observe the following points, attention to which saves the waste of much editorial time on trivial alterations:

1. Papers should be typewritten with double spacing, and on one side of the sheet only. Shorter contributions, if not typed, must be clearly written and with similar spacing. Failure to help in this way may result in delays to publication.

2. Notes should be worded as concisely as possible, and drawn up in the form in which they will be printed, with signature in block capitals and the writer's address clearly written on the same sheet. If more than one Note is submitted, each should be on a separate sheet, with signature and address repeated. In the case of rarity records, any supporting description which is too detailed for publication should be attached separately.

3. Certain conventions of style and lay-out are essential to preserve the uniformity of any publication. Authors of Papers in particular, especially of those containing Systematic Lists, Reference Lists, Tables, etc. should consult the ones in this issue as a guide to general presentation. English names of species should have capital initials for each word, except after a hyphen (e.g. Siberian Thrush, Yellow-headed Wagtail), but group terms should not (e.g. thrushes, wagtails). English names are those used in *The Handbook of British Birds*, with the exception of the changes listed in *British Birds* in 1953 (vol. xlv, pp. 2-3). The scientific name of each species should be given (in brackets and underlined) immediately after the first mention of the English name. Sub-specific names should not be used except where they are relevant to the discussion. It is sometimes more convenient to list scientific names in an appendix. Dates should take the form "1st January 1955" and no other, except in Tables where they may be abbreviated to "1st Jan.", "Jan. 1st", or even "Jan. 1", whichever most suits the lay-out of the Table concerned. It is particularly requested that authors should pay attention to Reference Lists, which otherwise cause much unnecessary work. These should take the following form:

TUCKER, B. W. (1949): "Species and subspecies: a review for general ornithologists." *Brit. Birds*, xlii: 129-134.

WITHERBY H. F. (1894): *Forest Birds: Their Haunts and Habits*. London. p. 34.

Various other conventions concerning references, including their use in the text, should be noted by consulting previous examples.

4. Tables should be numbered with Roman numerals, and the title typed above in the style used in this issue. The title and any headings within the Table should not be underlined, because this sometimes makes it difficult for the Editor to indicate the type to be used. It is most important that the lay-out of each Table should be carefully planned with an eye to its final appearance; above all, it should be borne in mind that Tables must either fit into the width of a page, or be designed to fit a whole page lengthways. All Tables should be self-explanatory.

5. Figures should be numbered with Arabic numerals, and the captions typed on a separate sheet. All line-drawings should be in Indian ink on good quality drawing paper (not of an absorbent nature) or, where necessary, on graph paper, but this must be light blue or very pale grey. It is best if maps, graphs, etc., are drawn twice the size of the final reproduction (ideally, therefore, for the normal 4" width the original should be 8" wide); sketches of birds, however, should be only slightly larger than the size at which it is intended they should appear. It is always most important to consider how each drawing will fit into the page. The neat insertion of lettering, numbers, arrows, etc., is perhaps the most difficult part of Indian ink drawing and, unless he has had considerable experience of this kind of work, an author should seek the aid of a skilled draughtsman. The publishers regret that, owing to rising costs, it will in future be only in exceptional cases that they can undertake to have lettering inserted.





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CONTENTS OF VOLUME L, NUMBER 2, FEBRUARY 1957

---

	PAGE
Report on bird-ringing for 1955. By Robert Spencer ... ..	37
Photographic studies of some less familiar birds. LXXVIII— Mediterranean Black-headed Gull. Photographed by Dr. Peter Beretzki (plates 9-11). Text by P. A. D. Hollom ... ..	73
Notes:—	
Snipe with abnormal bill (J. B. Bottomley) (plate 16) ... ..	75
Black-headed Gulls feeding on hawthorn berries (R. Harrison) ...	75
Turtle Doves sun-bathing (Howard Bentham) ... ..	75
Behaviour of Bee-eater, Grey Wagtail and Starling with dragonflies (Bryan L. Sage) ... ..	76
Swallows apparently feeding on torpid flies (Noel Currier and Michael Howorth) ... ..	76
Song Thrush breeding in October (W. S. Craster) ... ..	77
Desert Wheatear in Co. Durham (Fred G. Gray) (plates 12-13) ...	77
Unusual nest-site of Sedge Warbler (A. Leavesley) ... ..	78
Crossbills feeding on elm leaves (Miss Winifred U. Flower) ... ..	79
Hybrid Tree × House Sparrow in Dorset (Dr. K. B. Rooke) (plates 14 and 15, upper) ... ..	79
Hybrid Tree × House Sparrow in Norfolk (R. A. Richardson) (plate 15, lower) ... ..	80
Review:—	
<i>Studies on Great Crested Grebes.</i> By K. E. L. Simmons ... ..	81
Letters:—	
Iceland Redwings wintering (Kenneth Williamson) ... ..	84
Information wanted on Black Woodpeckers (R. S. R. Fitter) ... ..	84

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Cover photograph by Stuart Smith: Black-tailed Godwit (*Limosa limosa*)



5 FEB 1957  
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FEBRUARY  
1957



## BRITISH BIRDS

### REPORT ON BIRD-RINGING FOR 1955\*

By ROBERT SPENCER, B.A.

*Secretary, Bird-Ringing Committee of the British Trust for Ornithology.*

THIS is the nineteenth† report issued on behalf of the Bird-Ringing Committee. It combines a report on the progress of ringing during 1955 with a selected list of recoveries reported for that year.

#### MANAGEMENT AND ADMINISTRATION

The members of the Committee are as follows : Sir Landsborough Thomson (*Chairman*), Miss E. P. Leach, A. W. Boyd, Hugh Boyd, J. A. Gibb, P. A. D. Hollom, G. R. Mountfort, Major-General C. B. Wainwright, George Waterston ; Sir Norman Kinnear (representing the Trustees of the British Museum) ; Bruce Campbell and C. A. Norris (*ex officiis*) ; Robert Spencer (*Secretary*). Miss M. Hewitt was succeeded by D. J. Summers in March, who was in turn succeeded by J. L. F. Parslow as full-time assistant. Miss V. Palmer joined the staff in July.

Miss E. P. Leach remained in charge of all reports of birds ringed by other schemes, and in addition gave much help throughout the year. Her assistance in tracing obscure localities has been invaluable.

The headquarters of the scheme remain at the British Museum (Natural History) by permission of the Trustees. Rings are inscribed "BRIT. MUSEUM LONDON S.W.7" but rings bearing the fuller address "British Museum Nat. Hist. London" will remain in circulation for many years.

\* A publication of the British Trust for Ornithology.

†The last preceding report was published in *British Birds*, vol. xlviii, pp. 461-498.



Copies of the revised " Rules and Instructions ", to take effect in January 1956, were issued to all ringers in December. Under the new regulations each ringer must hold a Ringer's Permit, issued by the Committee. Three classes of permit are available : " A " for the ordinary individual ringer ; " B " for the ringer who wishes to ring solely on behalf of some corporate group or observatory ; and " C " which is primarily for probationers.

#### FINANCE

The salaries of the secretary and his assistant were again met by a generous grant from the Nature Conservancy. To meet other expenses it was necessary to augment the income derived from the " sale " of rings by grants of £270 from the main funds of the Trust, and of £25 from the publishers of *British Birds*. The full accounts for 1955 appear in the Annual Report of the Trust.

#### PROGRESS OF RINGING

The year 1955 was one of rapid expansion, the total of birds ringed being 126,303 (see Table I). This represents an increase of some 23,000 over the figure for the previous twelve months. It will be noted that the increase is solely due to the rise in the numbers of trapped birds (an indication of the increasing efficiency of trapping methods rather than an increase in the number of trappers), and it is cause for concern that the proportion of nestlings in the annual total is steadily falling, for the subsequent recovery of birds ringed in the nest yields important information which cannot normally be derived from the recovery of birds ringed when free-flying.

Nine species were ringed for the first time in 1955 : Smew (Major-General Wainwright) ; Red-footed Falcon (Fair Isle B.O.) ; White-rumped (or Bonaparte's) Sandpiper (Cambridge Bird Club) ; Buff-breasted Sandpiper (Portland B.O.) ; Scops Owl (Skokholm B.O.) ; Shore Lark (Dungeness B.O.) ; Thick-billed Warbler, *Phragamaticola aedon* (Fair Isle B.O.) ; Orphean Warbler (Portland B.O.) ; and Bonelli's Warbler (Portland B.O.).

Twenty-eight individual totals exceeded 1,000 and five were in excess of 5,000. The bird observatories accounted for approximately 30,000 of the total. Restrictions of space do not permit further comment on the many and varied successes of the year, but full details are presented in Table II, which has been extended this year to form a definitive list of birds ringed in this country since the inception of the scheme.

#### RECOVERIES

4,063 recoveries were handled in 1955 compared with 3,043 in 1954 ; an increase of a third. A corresponding increase in the size of the report is not possible and so selection for publication has been, of necessity, yet more rigorous. In species for which many recoveries have already been published summaries are given, or only those

records which add to our knowledge of distribution, speed of movement or longevity. In compensation, Table II again shows the number of recoveries reported for each species, and a final column has been added showing "Grand Total Recoveries."

Amongst the many interesting recoveries the larger series, such as the shearwaters from Brazil and the many ducks and geese from the Soviet Union, are not likely to be overlooked. Some single recoveries, however, break new ground and attention may be drawn to the first Lapwing recovery in the U.S.S.R., the first foreign recoveries of Little Ringed Plover and Spotted Redshank and two outstanding Turnstone movements. Of the Passerines recovered, there are the second report of a ringed Swallow in the Belgian Congo, Skylarks reported from Norway and Finland, and the first foreign recoveries of Blue Tit and Lesser Whitethroat, in France and Israel respectively.

#### PUBLICATIONS

The following papers make use of the recoveries of the scheme :—

R. G. B. Brown (1955) : "The migration of the Coot in relation to Britain." *Bird Study*, vol. 2, pp. 135-142.

J. C. Coulson and E. White (1955) : "Abrasion and loss of rings among sea birds." *Bird Study*, vol. 2, pp. 41-44.

For particulars of the ringing of ducks and geese see also :—Peter Scott and Hugh Boyd (1955) : *Seventh Annual Report of the Wildfowl Trust*, 1953-54.

**Table I**

#### NUMBER OF BIRDS RINGED

	<i>Juv.-Ad.</i>	<i>Pullus†</i>	<i>Total</i>
1955 .....	90,585	35,718	126,303
1954 (1.10.53-31.12.54)* .....	77,809	36,684	114,493
1953 .....	63,318	35,199	98,517
1952 .....	56,867	39,459	96,326
1951 .....	49,364	36,379	85,743
1950 .....	42,112	33,994	76,106
1949 .....	27,496	29,965	57,461
1948 .....	18,413	20,911	39,324
1947 .....	14,574	14,007	28,581
1946 .....	8,909	8,412	17,321
Grand Total ( <i>including arrears</i> )			1,481,552

† An explanation of the term "pullus" or "pull." appears on page 45.

\*The ringing year formerly commenced on 1st October. In 1954 it was decided to make it coincide with the calendar year, and there was accordingly a "year" of 15 months.

Table II

## RINGING AND RECOVERY TOTALS TO 31.12.55

(Save for a limited number of races, generally identifiable in the field, and traditionally treated trinomially (e.g. wagtails), subspecies have been "lumped".

It has been found necessary to omit from the two recovery columns the retraps—records of birds caught again locally and released—of which large numbers exist for certain species, especially "garden birds". Certain records of birds found dead by the ringer remain to be incorporated.)

	<i>Ringed</i>				<i>Recovered</i>	
	<i>Juv-Ad.</i>	<i>pull.</i>	<i>1955 Total</i>	<i>Grand Total</i>	<i>1955</i>	<i>Grand Total</i>
Leach's Petrel ...	—	—	—	233	—	—
Storm Petrel... ..	357	69	426	2,372	—	5
Manx Shearwater ...	5,179	1,329	6,508	60,502	41	635
Fulmar ... ..	88	161	249	2,595	6	27
Gannet ... ..	89	1,348	1,437	16,292	52	638
Cormorant ... ..	3	90	93	3,888	43	886
Shag ... ..	127	527	654	4,519	81	474
Heron... ..	7	348	355	3,450	29	481
Mallard ... ..	1,723	95	1,818	15,542	291	1,585
Teal ... ..	2,833	3	2,836	18,367	370	2,666
Wigeon ... ..	226	—	226	1,578	58	239
Pintail ... ..	32	8	40	387	12	67
Shoveler ... ..	37	15	52	319	9	58
Tufted Duck... ..	16	—	16	565	14	130
Eider ... ..	61	—	61	993	4	50
Shelduck ... ..	8	23	31	572	3	31
Grey Lag Goose ...	—	9	9	149	28	85
White-fronted Goose	—	—	—	253	14	63
Pink-footed Goose ...	1,144	—	1,144	4,600	275	945
Canada Goose ... ..	79	69	148	385	6	17
Buzzard ... ..	10	29	39	819	5	39
Sparrowhawk ... ..	11	2	13	1,225	10	182
Hen Harrier ... ..	—	45	45	250	9	34
Montagu's Harrier ...	—	8	8	186	3	22
Peregrine ... ..	—	3	3	151	2	22
Merlin ... ..	3	7	10	509	1	75
Kestrel ... ..	20	54	74	1,873	14	210
Red Grouse ... ..	—	—	—	262	—	9
Water Rail ... ..	28	—	28	175	2	6
Corncrake ... ..	3	—	3	684	—	11
Moorhen ... ..	247	31	278	3,578	6	86
Coot ... ..	193	6	199	1,110	17	75
Oystercatcher ... ..	19	234	253	4,536	30	220
Lapwing ... ..	123	2,451	2,574	59,609	55	1,177
Ringed Plover ... ..	66	161	227	3,201	4	41
Little Ringed Plover	—	15	15	100	3	3
Golden Plover ... ..	—	19	19	469	2	16
Turnstone ... ..	47	—	47	173	2	3
Snipe ... ..	120	61	181	2,633	6	119
Woodcock ... ..	11	18	29	5,590	2	426
Curlew ... ..	23	235	258	5,518	16	222
Common Sandpiper ...	148	62	210	2,605	1	15
Redshank ... ..	81	187	268	4,188	12	122



	Ringed				Recovered	
	<i>Juv.-Ad.</i>	<i>pull.</i>	<i>1955 Total</i>	<i>Grand Total</i>	<i>1955</i>	<i>Grand Total</i>
Dunlin ... ..	150	8	158	577	3	6
Stone Curlew ... ..	—	1	1	338	—	17
Arctic Skua ... ..	43	58	101	478	2	8
Great Skua ... ..	3	39	42	1,117	2	34
Great Black-backed Gull... ..	10	101	111	1,375	7	66
Lesser Black-backed Gull ... ..	10	1,012	1,022	18,060	45	714
Herring Gull ... ..	160	992	1,152	20,007	45	706
Common Gull ... ..	76	63	139	3,891	7	158
Black-headed Gull ... ..	105	1,493	1,598	33,443	117	1,451
Kittiwake ... ..	159	832	991	7,249	22	113
Common Tern ... ..	5	807	812	25,401	8	512
Arctic Tern ... ..	99	876	975	9,633	6	79
Roseate Tern ... ..	—	374	374	2,503	—	21
Little Tern ... ..	25	64	89	1,556	—	14
Sandwich Tern ... ..	—	1,528	1,528	26,828	13	419
Razorbill ... ..	98	332	430	8,690	10	211
Guillemot ... ..	47	219	266	5,552	10	179
Black Guillemot ... ..	4	18	22	332	—	4
Puffin... ..	301	162	463	9,626	3	43
Stock Dove ... ..	24	72	96	1,683	14	102
Woodpigeon ... ..	41	160	201	5,891	20	337
Turtle Dove ... ..	126	38	164	1,214	—	30
Cuckoo ... ..	50	27	77	1,527	3	35
Barn Owl ... ..	8	9	17	1,083	8	133
Little Owl ... ..	12	27	39	1,327	5	105
Tawny Owl ... ..	13	28	41	2,090	6	129
Long-eared Owl ... ..	4	7	11	415	1	22
Short-eared Owl ... ..	—	11	11	304	4	21
Nightjar ... ..	2	6	8	347	—	8
Swift ... ..	280	141	421	3,310	6	53
Kingfisher ... ..	2	—	2	839	—	35
Green Woodpecker ... ..	8	11	19	318	1	9
Great Spotted Wood- pecker ... ..	38	10	48	457	3	17
Wryneck ... ..	3	13	16	448	1	9
Woodlark ... ..	—	—	—	277	—	2
Skylark ... ..	189	248	437	6,664	4	37
Swallow ... ..	360	3,199	3,559	68,474	22	428
House Martin ... ..	216	7	223	16,258	2	126
Sand Martin ... ..	1,368	29	1,397	8,407	3	22
Raven ... ..	—	19	19	613	6	60
Carion Crow ... ..	10	73	83	2,905	9	161
Hooded Crow ... ..	2	2	4	202	—	10
Rook ... ..	118	208	326	7,370	26	360
Jackdaw ... ..	225	97	322	7,518	27	367
Magpie ... ..	23	30	53	2,456	7	97
Jay ... ..	53	36	89	1,324	10	81
Chough ... ..	1	12	13	166	1	6
Great Tit ... ..	2,395	815	3,210	28,378	41	491
Blue Tit ... ..	6,196	1,224	7,420	55,369	118	988
Coal Tit ... ..	315	159	474	3,544	10	50
Marsh Tit ... ..	135	57	192	1,160	—	14
Willow Tit ... ..	7	—	7	121	—	—
Long-tailed Tit ... ..	46	—	46	394	—	—

<i>Ringed</i>					<i>Recovered</i>	
	<i>Juv.-Ad.</i>	<i>pull.</i>	<i>1955 Total</i>	<i>Grand Total</i>	<i>1955</i>	<i>Grand Total</i>
Nuthatch ...	93	8	101	1,472	6	36
Treecreeper ...	18	21	39	1,050	—	—
Wren ...	431	22	453	7,164	4	26
Dipper ...	23	141	164	3,127	2	37
Mistle Thrush ...	244	170	414	7,775	12	175
Fieldfare ...	107	—	107	499	2	6
Song Thrush ...	2,224	1,683	3,907	94,175	146	2,039
Redwing ...	310	—	310	2,686	7	28
Ring Ouzel ...	14	73	87	1,155	2	14
Blackbird ...	6,528	2,803	9,331	115,411	434	3,506
Wheatear ...	1,141	227	1,368	8,386	7	33
Stonechat ...	51	17	68	1,657	—	11
Whinchat ...	198	42	240	3,528	5	10
Redstart ...	262	310	572	6,788	3	14
Black Redstart ...	26	27	53	336	1	6
Nightingale ...	45	25	70	3,092	—	11
Robin ...	2,761	527	3,288	51,018	78	1,153
Grasshopper Warbler	24	11	35	296	—	—
Reed Warbler ...	90	118	208	2,221	1	9
Sedge Warbler ...	874	157	1,031	5,118	1	8
Blackcap ...	114	26	140	2,189	2	7
Garden Warbler ...	139	30	169	2,513	1	2
Whitethroat ...	2,746	373	3,119	19,977	16	66
Lesser Whitethroat ...	145	22	167	1,410	1	2
Willow Warbler ...	2,806	527	3,333	31,130	4	84
Chiffchaff ...	753	45	798	4,363	4	11
Wood Warbler ...	9	51	60	1,863	—	10
Goldcrest ...	89	—	89	1,475	—	4
Spotted Flycatcher ...	290	263	553	8,018	2	49
Pied Flycatcher ...	386	560	946	8,675	3	14
Dunnock ...	1,901	404	2,305	30,264	35	404
Meadow Pipit ...	931	290	1,221	13,031	10	106
Tree Pipit ...	16	61	77	2,910	—	7
Rock Pipit ...	496	62	558	3,710	3	26
Pied Wagtail...	536	313	849	12,364	17	177
Grey Wagtail ...	11	79	90	1,772	—	7
Yellow Wagtail ...	514	177	691	4,249	4	19
Red-backed Shrike ...	22	54	76	1,490	1	6
Starling ...	21,956	760	22,716	164,707	827	5,677
Hawfinch ...	6	—	6	156	—	2
Greenfinch ...	3,397	305	3,702	52,777	71	669
Goldfinch ...	149	35	184	1,564	1	11
Linnet ...	745	453	1,198	20,452	16	136
Twite ...	81	16	97	1,265	1	5
Lesser Redpoll ...	11	6	17	798	—	8
Bullfinch ...	94	48	142	2,775	2	35
Crossbill ...	—	3	3	139	—	2
Chaffinch ...	2,575	281	2,856	57,343	45	608
Brambling ...	153	—	153	2,578	3	19
Yellowhammer ...	298	207	505	10,180	2	83
Corn Bunting ...	33	17	50	340	—	1
Girl Bunting ...	—	2	2	131	—	—
Reed Bunting ...	744	43	787	5,800	3	24
Snow Bunting ...	94	—	94	390	—	—
House Sparrow ...	5,725	176	5,901	34,969	69	445
Tree Sparrow ...	160	138	298	4,360	1	34

## SPECIES OF WHICH LESS THAN 100 HAVE BEEN RINGED

55 total, grand total, 1955 recoveries and grand total recoveries are given in that order).

Black-throated Diver	—	1	—	—	Gull-billed Tern	...	—	1	—	1
Great Northern Diver	1	2	—	—	Little Auk	...	4	12	—	1
Red-throated Diver	2	6	2	3	Rock Dove	...	5	73	—	3
Great Crested Grebe	—	20	—	—	Scops Owl	...	1	1	—	—
Red-necked Grebe	—	1	—	—	Snowy Owl	...	—	1	—	—
Slavonian Grebe	...	—	1	—	Hoopoe	...	—	2	—	—
Little Grebe	...	13	96	1	5	Lesser Spotted				
Wilson's Petrel	...	—	1	—	—	Woodpecker	...	1	55	—
Little Bittern	...	—	1	—	—	Short-toed Lark	...	—	1	—
Bittern	...	—	45	—	—	Shore Lark	...	1	1	—
Garganey	...	9	75	1	9	Golden Oriole	...	—	1	—
Gadwall	...	3	79	2	8	Crested Tit	...	2	33	—
Red-crested Pochard	—	8	—	3	Bearded Tit	...	—	47	—	—
Scaup	...	9	12	—	—	American Robin	...	—	1	—
Pochard	...	2	99	2	21	Siberian Thrush	...	—	1	—
Goldeneye	...	—	5	—	—	Gray-cheeked Thrush	—	1	—	—
Long-tailed Duck	...	—	2	—	—	Desert Wheatear	...	1	2	—
Velvet Scoter	...	—	1	—	1	Black-eared				
Common Scoter	...	1	8	—	1	Wheatear	...	—	1	—
Red-breasted Mer-						Pied Wheatear	...	—	1	—
ganser	...	—	9	—	1	Bluethroat	...	7	46	—
Goosander	...	—	52	—	10	Marsh Warbler	...	—	42	—
Smew	...	1	1	—	—	Paddyfield Warbler	—	1	—	—
Brent Goose	...	—	1	—	—	Aquatic Warbler	...	2	3	—
Barnacle Goose	...	—	3	—	1	Thick-billed Warbler	1	1	—	—
Mute Swan	...	25	44	—	3	Melodious Warbler	3	7	—	—
Whooper Swan	...	1	3	1	1	Icterine Warbler	4	33	—	—
Golden Eagle	...	—	19	—	—	Olivaceous Warbler	—	1	—	—
Marsh Harrier	...	12	84	1	6	Barred Warbler	...	24	70	—
Hobby	...	—	48	—	—	Orphean Warbler	1	1	—	—
Red-footed Falcon	1	1	—	—	—	Subalpine Warbler	1	5	—	—
Black Grouse	...	—	3	—	—	Dartford Warbler	—	40	—	—
Capercaillie	...	—	3	—	—	Greenish Warbler	2	5	—	—
Red-legged Partridge	1	14	—	1	—	Bonelli's Warbler	1	1	—	—
Partridge	...	—	79	—	2	Arctic Warbler	...	—	1	—
Quail	...	—	3	—	—	Yellow-browed				
Pheasant	...	1	56	—	4	Warbler	...	1	26	—
Spotted Crake	...	—	4	—	—	Pallas's Warbler	...	—	1	—
Kentish Plover	...	—	1	—	—	Yellowthroat	...	—	1	—
Grey Plover	...	—	2	—	1	Firecrest	...	6	23	—
Dotterel	...	8	23	—	—	Red-breasted Fly-				
Jack Snipe	...	17	48	—	2	catcher	...	5	37	—
Whimbrel	...	—	79	—	—	Tawny Pipit	...	—	1	—
Bar-tailed Godwit	1	10	—	—	—	White Wagtail	...	27	94	—
Green Sandpiper	...	10	45	—	—	Blue-headed Wagtail	—	11	—	—
Wood Sandpiper	...	5	24	—	—	Yellow-headed				
Spotted Redshank	3	6	1	1	—	Wagtail	...	—	2	—
Greenshank	...	2	27	—	1	Waxwing	...	—	7	—
Knot	...	3	20	1	1	Great Grey Shrike	6	27	—	1
Purple Sandpiper	4	14	—	—	—	Lesser Grey Shrike	2	3	—	1
Little Stint	...	1	18	—	—	Woodchat Shrike	1	8	—	—
Temminck's Stint	—	1	—	—	—	Siskin	...	1	78	—
White-rumped						Mealy Redpoll	...	1	18	—
Sandpiper	...	1	1	—	—	Greenland Redpoll	21	27	—	1
Pectoral Sandpiper	—	2	—	—	—	Scarlet Grosbeak	...	2	8	—
Curlew Sandpiper	—	16	—	—	—	Pine Grosbeak	...	—	1	—
Sanderling	...	11	36	—	—	Black-headed				
Buff-breasted Sand-						Bunting	...	—	1	—
piper	...	1	1	—	—	Red-headed Bunting	—	2	—	—
Ruff	...	9	27	—	—	Yellow-breasted				
Grey Phalarope	...	1	3	—	—	Bunting	...	—	1	—
Red-necked Phala-						Ortolan Bunting	1	7	—	—
rope	...	—	21	—	—	Rustic Bunting	...	—	1	—
Glaucous Gull	...	—	2	—	1	Little Bunting	...	—	2	—
Little Gull	...	—	1	—	1	Lapland Bunting	6	22	—	—



## KEY TO RINGERS' INITIALS

BA	Miss B. Aldred	JM	J. MacGeoch
JWA	J. W. Allen	JRM	J. R. Mather
RWA	R. W. Arthur	MTM	M. T. Myers
SMDA	S. M. D. Alexander	WM	W. Murray
EB	E. Balfour	DBO	Dungeness Bird Observa- tory
HB	H. Barlow	MHBO	Monks' House Bird Ob- servatory
HVDB	H. Van den Bos	SBO	Skokholm Bird Observa- tory
JAB	J. A. Benington	IDP	I. D. Pennie
JASB	J. A. S. Borrett	IVBP	I. V. Balfour Paul
JJB	J. J. Boon	RP	R. Perry
RHB	R. H. Brown	DAR	D. A. Ratcliffe
RMB	R. M. Band	KBR	K. B. Rooke
RSB	R. S. Broke	MHR	M. H. Rowntree
AC	A. Cross	RWR	R. W. Robson
CBC	Cambridge Bird Club	CS	Clayesmore School
CSC	C. S. Clark	DS	Lord David Stuart
DBC	Dingle Bird Club	HNS	H. N. Southern
DFC	Dublin Field Club	HSS	Halifax Sci. Society
DMC	D. M. Cormack	LNHS	London Nat. Hist. Society
JBCC	J. B. C. Crompton	LPS	Leighton Park School
JCC	J. C. Coulson	OOS	Oxford Orn. Society
MOC	Midlothian Orn. Club	RS	R. Spencer
PJC	P. J. Chadwick	SES	St. Edmunds School
RPC	R. P. Cockbain	SNHS	Sorby Nat. Hist. Society
ED	E. Duffey	SS	Sedbergh School
GFD	G. F. Dixon	US	Uppingham School
RFD	R. F. Dickens	WNS	Wharfedale Naturalists' Society
RSD	R. S. Dove	NNT	Norfolk Naturalists' Trust
JCSE	J. C. S. Ellis	RFT	R. F. Thearle
PE	P. Evans	ACW	A. C. Whiteside
JF	J. Field	AFGW	A. F. G. Walker
JMF	J. M. Fisher	" W "	" Wippletree "
WUF	Miss W. U. Flower	AW	A. Wallis
FCG	F. C. Gribble	DRW	D. R. Wilson
JMG	J. M. Gunn	EW	E. White
AGH	A. G. Hurrell	REW	R. E. Williams
BH	B. Huddart	RGW	R. G. Wheeler
DFH	D. F. Harle	A&R	Ash & Ridley
EGH	E. G. Holt	B&T	Bilby & Taylor
GHH	G. H. Hughes-Onslow	C&C	Campbell & Campbell
HGH	H. G. Hurrell	CC&M	Cowin, Crellin & Moss
KH	K. Holdsworth	L&R	Leics. & Rutland Orn. Society
WGH	W. G. Hale	N&L	Nelson & Leedal
EGI	Edward Grey Institute	ND&N	Northumberland, Durham and Newcastle N.I.S.
AHJ	A. H. Johnson	P&B	Pymon & Barton
DJ	D. Jenkins	S&W	Smith & Walker
ECMK	Mrs. E. C. M. Knowles	W&M	Watts & McConville
JEK	J. E. King		
JL	J. Lees		
RML	R. M. Lockley		
AEM	A. E. Male		
CM	C. Moriarty		
CKM	C. K. Mylne		
CLM	C. L. Maingay		

NOTE.—Ringers' initials are omitted when the ringing was carried out:

- (i) at an observatory (Bardsey, Cley, Dungeness, Fair Isle, Gibraltar Point, Lundy, Isle of May, Portland, Saltee Skokholm and Spurn);
- (ii) at Abberton Reservoir—where all ringing is carried out by Major-General C. B. Wainwright;
- (iii) by the Wildfowl Trust (nearly all ducks and geese).

## Selected List of Recoveries Reported during 1955

## Key to Symbols and Terms

Ring Number : Where this is in *italics* the ring has been returned.

O : Indicates bird breeding, or bred, at place of ringing.

Age : pull. (pullus)—nestling or chick, *not yet flying*.

juv.—young, *able to fly freely* ;

1stW.—first winter ;

f.g.—full-grown, age uncertain ;

ad.—adult.

Sex : ♂—male ; ♀—female.

v : caught or trapped, and released with ring.

+ : shot or killed by man.

× : found dead or dying.

() : caught or trapped alive, and not released, or released but with ring removed.

/? : Manner of recovery unknown.

Date of Recovery : Where this is unknown the date of the report is given in brackets.

Distance : The distance, given in miles, and the directions, are approximate.

NOTE : The format of this report, and the symbols and terms employed are those put forward for international adoption at the XIth International Ornithological Congress. In the following list ringing details are given in the first or first and second lines with recovery data on a new line below.

Manx Shearwater (*Procellaria puffinus*)

<i>TI6447</i>	ad.	1.7.53	Skokholm I. : 51°42'N. 5°16'W. (Pemb.)
×		22.10.55	Itanhaem : 24°7'S. 46°44'W. (São Paulo) <b>Brazil</b>
<i>TI6559</i>	ad.	2.7.53	Skokholm
×		12.12.54	Itanhaem, <b>Brazil</b>
<i>222469</i>	ad.	1.7.54	Skokholm
+		12.4.55	Off Santa Barbara : 17°55'S. 38°39'W. (Abrolhos) <b>Brazil</b>
<i>25037</i>	O pull.	5.9.54	Skokholm
×		22.11.55	Florianopolis : 27°32'S. 48°30'W. Santa Catharina I. <b>Brazil</b>
<i>37604</i>	O pull.	29.8.55	Skokholm
×		29.10.55	Nr. Itanhaem, <b>Brazil</b>
<i>37929</i>	O pull.	1.9.55	Skokholm
×		22.11.55	Rio de Janeiro : 22°55'S. 43°12'W. <b>Brazil</b>
<i>37976</i>	O pull.	7.9.55	Skokholm
×		25.10.55	Santos : 23°58'S. 46°20'W. (São Paulo) <b>Brazil</b>
<i>38100</i>	O pull.	10.9.55	Skokholm
×		24.11.55	Nr. Itanhaem, <b>Brazil</b>

There are only two earlier records of Manx Shearwaters being recovered in South America, one in November 1951 and one in October 1952. The remarkable concentration of four birds at Itanhaem may be due to the fact that it is a holiday beach, where the birds would be more likely to be noted. AT22469 was taken by a fishing boat at what appears to be a very late date. AT37976 is particularly note-worthy for the speed of its migration.

The remaining 15 foreign recoveries are from France, and do not call for special comment. Of the 41 birds recovered, one had been ringed in 1946, 2 in 1947 and one in 1948, all four as adults.

**Fulmar** (*Fulmarus glacialis*)

AT13138	O	pull.	24.8.54	Sula Sgeir : <i>ca.</i> 59°06'N. 6°10'W. Outer Hebrides. JMF
	×		0.4.55	Les Sables D'Olonne : 46°30'N. 1°47'W. (Vendée) <b>France</b>
AT13418	O	pull.	26.8.54	Sula Sgeir. JMF
	()		10.12.55	At sea off S.W. Ireland 49°30'N. 11°05'W.
AT13431	O	pull.	26.8.54	Sula Sgeir. JMF
	×		<i>ca.</i> 31.10.54	Nr. Bredstedt : 54°37'N. 8°58'E. (Schleswig-Holstein) <b>Germany</b>
AT27306	O	pull.	21.8.54	Sula Sgeir. JM
	×		12.1.55	Bellevue : 47°38'N. 53°45'W. <b>Newfoundland</b>
AT33862	O	pull.	15.8.55	Duncansby Head : 58°39'N. 3°01'W. (Caithness) DMC
	×		16.9.55	The Hague : 52°03'N. 4°17'E. <b>Holland</b>

**Gannet** (*Sula bassana*)

510939	O	pull.	18.7.53	Bass Rock : 56°04'N. 2°38'W. (E. Lothian). IVBP
	+		22.12.55	Sletter, Oslofjord : <i>ca.</i> 59°30'N. 10°30'E. <b>Norway</b>
511575	O	pull.	4.7.54	Bass Rock. JEK
	×		16.10.55	Havel : 56°23'N. 8°08'E. (Jutland) <b>Denmark</b> <sup>1</sup>
511583	O	pull.	4.7.54	Bass Rock. JEK
	+		12.11.55	Port St. Louise du Rhône : 43°23'N. 4°48'E. (Bouches-du-Rhône) <b>France</b>
512940	O	pull.	5.7.55	Bass Rock. IVBP
	v		22.11.55	Cap Milonia : 35°09'N. 2°09'W. (Oran) <b>Algeria</b>
507806	O	pull.	15.7.51	Bass Rock. IVBP
	v		7.7.55	l'Alma : <i>ca.</i> 36°44'N. 3°23'E. (Alger) <b>Algeria</b>

Forty-seven other recoveries include 4 from France, 3 from Holland, 1 from the Iberian Peninsula and 12 from Africa, and do not call for special comment. The oldest bird was ringed as an adult on Grassholm in 1946, and recovered in Devon in January 1955. The majority of the birds died within 18 months of being ringed. Recoveries from the Mediterranean are exceptional.

**Cormorant** (*Phalacrocorax carbo*)

Birds from the west coast colonies in Pembroke, Anglesey and Dublin were reported off the French coast in winter : Morbihan (3), Charente-Maritime (1), Finistère (1), Côtes-du-Nord (1). Winter recoveries from the north Irish colonies were from Wexford (1), Cumberland (1) and Perthshire (1) and five from Northern Ireland. Twenty-two birds from the Farne Islands were reported at east coast localities up to distances of 150 miles north or south. There are also the following recoveries :

127785	O	pull.	17.7.47	Mochrum Loch : 54°47'N. 4°34'W. (Wigtownshire). D
	×		<i>ca.</i> 21.3.55	Cruden Bay (Aberdeenshire) 210m. N.E.
507899	O	pull.	9.7.52	Puffin I. : 53°19'N. 4°01'W. (Anglesey). RFT
	×		1.3.55	Wells (Norfolk) 200m. E.
511450	O	pull.	13.6.54	Lambay I. : 53°29'N. 6°01'W. (Dublin). RGW
	+		27.2.55	Cies Is. : 42°12'N. 8°53'W. Vigo, <b>Spain</b>
510178	O	pull.	28.6.53	St. Margaret's I. : 51°38'N. 4°42'W. (Pembrokeshire). RM
	+		(27.9.55)	Vila Nova de Cerveira : 41°54'N. 8°44'W. (Minho) <b>Portugal</b>
131239	O	pull.	1.9.54	Farne Is. : 55°37'N. 1°37'W. (Northumb.). ND&N.
	/?/		13.11.54	Port en Bessin : 49°21'N. 0°45'W. (Calvados) <b>France</b>



**Shag** (*Phalacrocorax aristotelis*)

Forty recoveries of birds ringed on Lundy show a tendency to movement into the English Channel during the autumn and winter, with 11 recoveries in Brittany, 8 in the 1st winter, 2 in the 2nd and 1 in the 3rd. Seventeen recoveries of birds ringed in the Firth of Forth (St. Abbs Head, Bass Rock and Isle of May) show movement during the winter northwards as far as Aberdeen and south to the Humber. Birds from the Farne Isles include two from the Moray Firth, 8 local, and 7 south to Essex, Sussex and Pas-de-Calais. There are also the following :—

128876	O	pull.	18.7.49	Suleskerry : ca. 58°55'N. 3°16'W. (Orkney). IDP
	+	ca.	28.7.55	Suleskerry.
506884	O	pull.	23.6.51	Maughold Head : 54°18'N. 4°19'W. Isle of Man. CC&M
	×		29.5.55	Burial I. (Down) 48m. N.W.
511226	O	pull.	27.6.54	Bardsey I. : 52°46'N. 4°48'W. (Caerns.)
	×		24.5.56	Nr. Horsey (Norfolk) 270m. W.
508862	O	pull.	23.6.52	Lundy : 51°12'N. 4°40'W. (Devon)
	+		4.9.55	Keeragh I. (Wexford) 115m. N.W.

**Heron** (*Ardea cinerea*)

13129	O	pull.	5.5.37	Nr. St. Neots : 52°14'N. 0°16'W. (Beds.). CSC
	×		6.5.55	Nr. Over (Cambs.). 15m. E.N.E.

This is the oldest Heron so far recorded by the scheme.

28611	O	pull.	22.5.50	Jurby : 54°21'N. 4°32'W. Isle of Man. CC&M
	×		18.6.55	Nr. Barnoldswick (Yorks.). 95m. S.E.
08276	O	pull.	2.5.54	Deeping St. James : 52°40'N. 0°17'W. (Lincs.). DRW
	×		(3.11.55)	Bransford (Worcestershire) 90m. W.S.W.
12601	O	pull.	12.5.55	Wytham : 51°47'N. 1°19'W. (Berks.). EGI
	×		(8.7.55)	Isle of Oxney (Kent) 100m. S.E.
06645	O	pull.	2.5.54	Wiveton : 52°57'N. 1°02'E. (Norfolk). CBO
	×		24.1.55	Nr. Richmond (Yorkshire) 150m. N.W.

**Mallard** (*Anas platyrhynchos*)

27233	juv. ♂	4.9.52	Abberton : 51°50'N. 0°53'E. (Essex)
	v	29.9.53	De Koog : 53°6'N. 4°48'E. Texel, Holland
	v	23.11.53	ibid
	v	26.10.54	ibid
	v	21.10.55	ibid

Of 184 recoveries in Britain only 34 indicated movement of more than 50 miles, five of these being of birds ringed in England and recovered in Ireland. One hundred and ten Mallard were reported from abroad. The months in which they were *recovered* are shown in Table A ; the months of *ringing*, in Britain, are given in Table B.

TABLE A—COUNTRY AND MONTH OF RECOVERY OF MALLARD (*Anas platyrhynchos*)

Country of recovery.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Total
FRANCE ... ..				1			1	2		4	5	13
HOLLAND ... ..				1	3	6	3	7	3	2		25
DENMARK ... ..					2	3	2	4	3			14
GERMANY & POLAND	1	1			2		2	3	2			11
SWEDEN ... ..		1	1		3	3	3	1				12
FINLAND ... ..					5	1	2	1				9
U.S.S.R. ... ..	5	3			6	7	4					25

TABLE B—MONTH OF RINGING IN BRITAIN AND COUNTRY OF RECOVERY OF MALLARD (*Anas platyrhynchos*)

MONTH	FRANCE	HOLLAND	DENMARK	GERMANY & POLAND	SWEDEN	FINLAND	U.S.S.R.
AUG.	1	1		2*	1	1	
SEPT.	2	7	1	1	1	1	
OCT.	2	2	1		1		1
NOV.	2	4	2		1	2	4
DEC.	2	5				1	3
JAN.	2	2	1	1	1		2
FEB.	2	3	5	6	4	2	13
MAR.			3		2	2	2
APR.			1				
MAY		1		1	1		1*

\* Includes 1 bird ringed as "pullus."

NOTE.—Table A, which would appear to reflect European sporting habits, is subject to error in cases where the date of recovery has been assumed to be approximately that of the report, and where a bird may have been found several weeks after it died.

The number of ducks caught is influenced by various factors, especially weather conditions, and Table B is included primarily as an indication of the period during which ducks of presumed Continental origin are present in Britain.

#### Teal (*Anas crecca*)

910386	juv. ♂	18.1.51	Abberton : 51°50'N. 0°53'E. (Essex)
v		28.8.53	Doornspijk : 52°25'N. 5°49'E. (Gelderland) <b>Holland</b>
+		9.10.55	The Swale : 51°21'N. 0°55'E. Isle of Sheppey (Kent)
917102	f.g. ♂	15.10.54	Abberton
v		20.9.55	De Koog : 53°6'N. 4°48'E. Texel, <b>Holland</b>
+		1.10.55	Iken : 52°9'N. 1°33'E. (Suffolk)
905697	f.g. ♂	24.8.48	<b>Holland</b> , as "Leiden 206402"
v		14.1.51	Orielton : 51°40'N. 4°57'W. (Pemb.)
+		ca.7.3.55	Nr. Wexford : 52°20'N. 6°25'W.

One hundred and eighty-one Teal were recovered in the British Isles. Their movements may be summarised as follows :—

Where ringed	Distance travelled in miles					
	0-50	51-100	101-200	201-300	301-400	400+
East	60	28	33	16	15	18
West	4	3	7	4		

About three-quarters of the birds ringed in the East (Essex, Northants., Norfolk) were recovered in the autumn and winter at places lying between south and north-west of the ringing locality, 25 birds reaching Ireland.

Of the birds ringed in the West (Gloucestershire, Dorset, Pembroke) six were recovered in Ireland, the remainder being recovered to the north and east of the ringing localities.

One hundred and eighty-nine Teal were recovered abroad. The months in which they were *recovered* are shown in Table C; the months of *ringing* are given in Table D (but see footnote on Mallard recoveries).

TABLE C—COUNTRY AND MONTH OF RECOVERY OF TEAL (*Anas crecca*)

Country of recovery	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
Iberia ... ..						1		1			6		8
France & Belgium					2	2	1	3	11	5	7	4	35
Holland ... ..			1			6	7	2	2				18
Denmark ... ..					7	11	10	1		1			30
Germany & Poland				1	3	2	5	1	1				13
Norway & Sweden		2	1	3	3	2							11
Finland ... ..	1	4	2		7	5							19
U.S.S.R. ... ..	4	11	3	1	18	11	2	1					51*

\* In addition three birds were reported as "spring."

TABLE D—MONTH OF RINGING IN BRITAIN AND COUNTRY OF RECOVERY OF TEAL (*Anas crecca*)

MONTH	IBERIA	FRANCE AND BELGIUM	HOLLAND	DENMARK	GERMANY AND POLAND	NORWAY AND SWEDEN	FINLAND	U.S.S.R.
SEPT.	1	3	3	1	3	2	2	5
OCT.	3	5	2	5	2	2	2	6
NOV.	2	9	3	10	2		5	7
DEC.		7	2	2		3	4	12
JAN.	2	6	2	6	1	3	1	12
FEB.		5	6	6	5	2	4	8
MAR.							1	3
APR.							1	1



**Garganey** (*Anas querquedula*)

914541	juv. ♂	2.9.53	Abberton : 51°50'N. 0°53'E. (Essex)
+		15.3.55	Nr. Arezzo : 43°28'N. 11°54'E. (Toscana) <b>Italy</b>

**Gadwall** (*Anas strepera*)

936148	f.g. ♂	29.8.54	Borough Fen, Peakirk : 52°38'N. 0°17'W. (Northants.)
+		27.12.55	South Moor, Langport (Somerset) 157m. S.W.
916211	1st W. ♂	19.2.54	Abberton : 51°50'N. 0°53'E. (Essex)
+		10.12.55	Nr. Gort (Galway) 412m. W.N.W.

**Wigeon** (*Anas penelope*)

Fifty-eight Wigeon, ringed in Essex (52), Gloucestershire (3), Northants. (2) and Pembroke (1) were recovered as follows :—

TABLE E—COUNTRY AND MONTH OF RECOVERY OF WIGEON (*Anas penelope*)

Country of recovery	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
France ... ..									1	2	1	1	5
Ireland ... ..							1		2	1	1		5
England ... ..									1	4	1		6
Scotland ... ..						2							2
Holland ... ..								1		1			2
Germany... ..								1	1				2
Denmark ... ..						1		1	1				3
Sweden ... ..				1		1							2
U.S.S.R. & Poland	6	15	3		3	2							31*

\* Two recoveries from the U.S.S.R. are marked "summer" and have been excluded from the table.

The recovery areas in the U.S.S.R. and Poland are of some interest, and are summarised below in terms of longitude and latitude.

TABLE F—RECOVERIES OF WIGEON (*Anas penelope*) IN THE U.S.S.R. AND POLAND

Degrees North	NUMBER OF BIRDS RECOVERED Degrees East of Greenwich					
	15-25	25-35	35-45	45-55	55-65	65-75
70-80						1
60-70			1	1	3	5
50-60	3		9	2	3	1

NOTE.—One recovery locality, given as "Komi Republic", has been omitted from the above table.

**Pintail** (*Anas acuta*)

Orielton			
4018	ad. ♀	15.2.39	Orielton : 51°40'N. 4°57'W. (Pembs.)
×		12.6.41	Salyni : 56°38'N. 22°26'E. Saldus, <b>Latvian S.S.R.</b>
906686	juv. ♂	29.8.49	Slimbridge : 51°47'N. 2°28'W. (Glos.)
+		25.6.53	Kanin Peninsula : ca. 68°00'N. 45°00'E. (Archangel) <b>U.S.S.R.</b>

6699	f.g. ♀	12.10.49	Slimbridge
+		7.9.53	Vokhma : 58°55'N. 46°47'E. (Kostroma) <b>U.S.S.R.</b>
6701	f.g. ♀	12.10.49	Slimbridge
+		0.9.52	Nekrasovsk : 57°41'N. 40°21'E. (Yaroslav) <b>U.S.S.R.</b>
11847	ad. ♂	3.10.51	Slimbridge
/?/		10.5.53	Objachevo : 60°22'N. 49°38'E. (Komi Republic) <b>U.S.S.R.</b>
11855	ad. ♂	4.10.51	Slimbridge
/?/		15.5.55	Olonets : 60°59'N. 33°00'E. (Karelo-Finnish Republic) <b>U.S.S.R.</b>
4172	ad. ♂	21.1.53	Slimbridge
+		13.9.53	Spask-Klepiki : 55°08'N. 40°11'E. (Ryazan) <b>U.S.S.R.</b>
70627	f.g. ♂	1.10.52	Slimbridge
+		28.7.53	Rudensk : 53°36'N. 27°50'E. (Minsk) <b>U.S.S.R.</b>
32790	ad. ♀	14.10.53	Abberton : 51°50'N. 0°53'E. (Essex)
/?/		15.5.54	Ust-Tsilma : 65°26'N. 52°20'E. (Komi Republic) <b>U.S.S.R.</b>
32803	1st W. ♂	17.11.53	Abberton
/?/		0.8.54	Nr. Naryan Mar : 67°40'N. 53°00'E. (Archangel) <b>U.S.S.R.</b>

### Shoveler (*Spatula clypeata*)

32878	O ad. ♂	1.6.55	Abberton : 51°50'N. 0°53'E. (Essex)
+		28.8.55	Boismont, Nr. Abbeville : 50°10'N. 1°42'E. (Somme) <b>France</b>
32882	O f.g. ♂	20.6.55	Abberton
+		3.10.55	Nr. Kampen : 52°23'N. 5°55'E. (Overijssel) <b>Holland</b>
H2269	O pull.	26.6.55	Gladhouse Reservoir : 55°46'N. 3°08'W. (Midlothian). S & W
+		1.9.55	L. Eaval, North Uist, Outer Hebrides. 195m. N.W.
H2274	O pull.	26.6.55	Gladhouse Reservoir. S & W
+		15.10.55	Luton Hoo, Luton (Beds.) 290m. S.S.E.

### Tufted Duck (*Aythya fuligula*)

N1995	f.g. ♂	16.11.49	Kensington Gardens, London. LNHS
+		25.5.53	Naryan Mar : 67°40'N. 53°00'E. (Archangel) <b>U.S.S.R.</b>
N1983	f.g. ♂	21.11.49	Kensington Gardens, London. LNHS
+		16.5.54	Priozersk : 61°02'N. 30°10'E. <b>U.S.S.R.</b>
45286	f.g.	15.12.50	St. James's Park, London. LNHS
+		24.8.54	Nr. Riga : 56°57'N. 24°09'E. <b>Latvian S.S.R.</b>
10227	1st W.	8.1.51	Abberton : 51°50'N. 0°53'E. (Essex)
+		1.6.54	Nyda : 66°37'N. 72°45'E. (Tumen) <b>U.S.S.R.</b>
10437	1st W. ♀	25.1.51	Abberton
+		29.8.54	Salegard : 66°30'N. 66°40'E. (Tumen) <b>U.S.S.R.</b>
27280	ad. ♀	19.5.52	Abberton
+		20.9.53	Dmitriev-Lgov : 52°10'N. 35°05'E. (Kursk) <b>U.S.S.R.</b>

Note the late date of ringing of this bird.

32807	1st W. ♂	7.2.54	Abberton
+		8.8.54	Nyrovsk : 60°28'N. 56°45'E. (Molotov) <b>U.S.S.R.</b>
32825	ad. ♂	16.2.54	Abberton
×		30.5.55	Nystad archipelago : ca. 60°48'N. 21°30'E. <b>Finland</b>

### Pochard (*Aythya ferina*)

32852	f.g. ♂	17.12.54	Abberton : 51°50'N. 0°53'E. (Essex)
+		8.1.55	Nr. Newry (Armagh) ca. 340m. N.W.

**Eider** (*Somateria mollissima*)

405443	ad. ♀	8.5.53	Farne Is. : 55°37'N. 1°37'W. (Northumb.). ND&N
+		16.11.55	Nr. Anstruther (Fife) 57m. N.W.

**Grey Lag Goose** (*Anser anser*)

142898	ad.	22.11.52	Montrose : 56°42'N. 2°28'W. (Angus)
+		12.8.55	Vopnafjörður : 65°44'N. 14°51'W. <b>Iceland</b>
142795	ad.	21.11.52	Montrose
+		9.10.55	Hörgárdalur : ca. 65°38'N. 18°35'W. <b>Iceland</b>
143306	ad.	14.11.53	Kinross-shire
+		4.2.55	Kilmore (Wexford) 300m. S.S.W.
143201	ad.	14.11.53	Kinross-shire
+		23.5.54	Blönduós : 65°40'N. 20°18'W. <b>Iceland</b>
143458	ad.	22.11.53	Dumfriesshire
+		9.10.55	Hörgárdalur, <b>Iceland</b>
143444	1stW.	22.11.53	Dumfriesshire
+		0.6.54	Galtalaekur : 64°N. 19°4'W. <b>Iceland</b>
130010	ad.	16.1.51	Nr. Southwick : ca. 54°54'N. 3°41'W. (Kirkcudbright.)
+		11.5.53	Móberg : 65°35'N. 20°2'W. <b>Iceland</b>
127362	ad.	28.3.50	Nr. Southwick.
		20.11.55	Nisum Fjord : ca. 56°20'N. 8°10'E. (Jutland) <b>Denmark</b>

**White-fronted Goose** (*Anser albifrons*)

SWT41	1stW.	29.2.52	Slimbridge : 51°47'N. 2°28'W. (Gloucestershire)
/?		12.6.55	Belushye Bay : ca. 72°14'N. 52°20'E. (Novaya Zemlya)
			<b>U.S.S.R.</b>
129409	ad.	27.2.50	Slimbridge
/?		2.5.55	Shilovo : 54°19'N. 40°57'E. (Ryazan) <b>U.S.S.R.</b>
130618	ad. ♂	15.2.53	Slimbridge
/?		20.4.55	Serebrianye Proudye : 54°30'N. 38°45'E. (Moscow)
			<b>U.S.S.R.</b>
SWT43	1stW.	29.2.52	Slimbridge
/?		6.6.54	Belushye Bay, <b>U.S.S.R.</b>
SWT44	ad.	29.2.52	Slimbridge
/?		0.5.53	Belushye Bay, <b>U.S.S.R.</b>
127374	1stW.♀	15.2.53	Slimbridge
+		30.6.53	Zheleznye Vorota : ca. 72°N. 53°E. (Novaya Zemlya)
			<b>U.S.S.R.</b>
129283	ad.♀	17.2.53	Slimbridge
+		28.3.54	Barashi : 50°45'N. 28°1'E. (Zhitomir) <b>U.S.S.R.</b>
130624	ad.♂	17.2.53	Slimbridge
+		28.3.54	Barashi, <b>U.S.S.R.</b>
128047	ad.♂	18.2.48	Slimbridge
+		17.5.54	Semenovskoe : 62°52'N. 40°58'E. (Archangel) <b>U.S.S.R.</b>
130609	ad.♂	15.2.53	Slimbridge
×		0.12.55	Nr. Roskilde : 55°39'N. 12°7'E. (Sjaelland) <b>Denmark</b>
129428	ad.	27.2.50	Slimbridge
+		11.10.55	Malchiner Lake : ca. 53°42'N. 12°34'E. (Mecklenburg)
			<b>Germany</b>
SWT30	ad.	29.2.52	Slimbridge
+		1.12.55	Nr. Breege : 54°37'N. 13°22'E., Rügen, (Mecklenburg)
			<b>Germany</b>



330617	ad. ♂	15.2.53	Slimbridge
+		29.1.55	Hollandsch Diep : 51°42'N. 4°30'E. <b>Holland</b>
330436	ad.	10.3.51	Branteth : 55°4'N. 3°8'W. (Dumfries.)
+		(19.12.55)	Nr. Newtyle (Angus) room. N.

The last bird was identified as belonging to the Greenland race—*Anser bifrons flavirostris*.

### Pink-footed Goose (*Anser arvensis brachyrhynchus*)

Eight of the birds shot during the year had been ringed in Britain between 1950 and 1952 and recaptured in Iceland in the summer of 1953.

0475	ad.	10.3.51	Dumfriesshire
×		1954	Scoresby Sound : 70°20'N. 22°W. <b>Greenland</b>
1400	1stW.	26.10.54	Dumfriesshire
+		11.6.55	Scoresby Sound, <b>Greenland</b>
1140	ad.	25.10.54	Dumfriesshire
+	ca.	26.6.55	Zackenberg : 74°26'N. 20°40'W. <b>Greenland</b>
2244	ad.	19.10.52	Fife
+	ca.	26.6.55	Zackenberg, <b>Greenland</b>

### Buzzard (*Buteo buteo*)

33156	O	pull.	21.6.53	Boot : 54°24'N. 3°17'W. (Cumb.).	SS
	×		ca.15.6.54	Nr. Kirby Stephen (Westmorland)	37m. E.

### Sparrowhawk (*Accipiter nisus*)

2138	1stW. ♂	14.9.55	Fair Isle : 59°32'N. 1°37'W. (Shetland)
+		26.12.55	St. Jean-sur-Laval : 48°08'N. 0°45'W. (Mayenne) <b>France</b>
2145	f.g. ♀	9.10.55	Fair Isle
×		29.12.55	Cawdor (Nairnshire) 160m. S.S.W.
2085	ad. ♀	8.9.55	Spurn Point : 53°35'N. 0°06'E. (Yorkshire)
×		(30.10.55)	Earls Colne (Essex) 115m. S.S.E.
2231	1stW. ♀	29.10.52	Gibraltar Point : 53°06'N. 0°21'E. (Lincs.)
( )		Oct./Nov. 1955	Ravels : 51°22'N. 5°00'E. (Antwerp) <b>Belgium</b>

### Marsh Harrier (*Circus aeruginosus*)

466	O	pull.	19.6.55	Hickling Broad : 52°45'N. 1°35'E. (Norfolk).	ED
+		ca.	30.7.55	Newbury Downs (Berkshire)	150m. S.W.

### Hen Harrier (*Circus cyaneus*)

061	O	pull.	8.7.54	(Orkney) ca. 59°0'N. 3°0'W.	EB
×			14.1.55	Warthill, Meikle Wartle (Aberdeen)	110m. S.
062	O	pull.	8.7.54	(Orkney).	EB
×		ca.	26.2.55	Kirriemuir (Angus)	160m. S.
065	O	pull.	9.7.54	(Orkney).	EB
( )		ca.	16.4.55	Isle of Bute (Bute)	230m. S.S.W.
066	O	pull.	9.7.54	(Orkney).	EB
+			23.1.55	Monikie (Angus)	170m. S.

### Montagu's Harrier (*Circus pygargus*)

5543	O	pull.	15.7.55	Hickling Broad : 52°45'N. 1°35'E. (Norfolk).	ED
+			1.10.55	Nr. Montdidier : 49°39'N. 2°35'E. (Somme)	<b>France</b>

<i>AD4456</i>	O	pull.	13.7.52	New Forest : <i>ca.</i> 50°45'N. 1°30'W. (Hampshire).	REW
	×		31.5.54	Tresco, Scilly Is. (Cornwall) 225m. S.W.	

**Peregrine** (*Falco peregrinus*)

<i>408037</i>	O	pull.	2.6.51	<i>Nr.</i> Glen Trool : 55°5'N. 4°29'W. (Kirkcudbright.).	DAL
	×		11.4.55	Neilston (Renfrewshire) 48m. N.	
<i>408782</i>	O	pull.	25.5.53	Cairngorms : <i>ca.</i> 57°06'N. 3°38'W. (Banff.).	RFD
	×		(20.8.55)	Inveran, Poolewe (Ross.) 85m. N.W.	

**Kestrel** (*Falco tinnunculus*)

<i>3001552</i>	O	pull.	15.7.55	Harray : 59°03'N. 3°15'W. (Orkney).	EB
	+		25.9.55	<i>Nr.</i> Billingham (Sussex) 560m. S.S.E.	
<i>3001554</i>	O	pull.	4.7.55	Harray.	EB
	×		19.10.55	Hawthorn (Durham) 300m. S.S.E.	
<i>361728</i>	O	pull.	14.7.54	Burbage : 53°20'N. 1°39'W. (Yorkshire).	DRW
	/?/		9.10.54	Croix du Perche : 48°18'N. 1°03'E. (Eure-et-Loire)	France
<i>369928</i>	O	pull.	27.6.54	Ilkley : 53°56'N. 1°49'W. (Yorks.).	WNS
	×		9.1.55	Lancing (Sussex) 220m. S.S.E.	
<i>3000075</i>	O	pull.	18.7.55	<i>Nr.</i> Harrogate : <i>ca.</i> 53°59'N. 1°37'W.	S&W
	×		27.8.55	Formby (Lancashire) 65m. S.W.	
<i>362971</i>	O	pull.	30.6.52	Shardlow : 52°53'N. 1°22'W. (Derbyshire).	JBCC
	+		30.7.55	Streatley (Berks.) 95m. S.	
<i>382281</i>	O	pull.	8.7.54	<i>Nr.</i> Ilford : 51°34'N. 0°05'E. (Essex).	LNHS
	+	<i>ca.</i>	10.3.55	Noyers-St.-Martin : 49°33'N. 2°14'E. (Oise)	France

**Water Rail** (*Rallus aquaticus*)

<i>246883</i>		f.g. ♂	24.10.54	Fair Isle : 59°32'N. 1°37'W. (Shetland)	
	×		6.1.55	Copinsay (Orkney) 55m. S.W.	

**Coot** (*Fulica atra*)

<i>AE8807</i>		ad.	15.2.52	Abberton : 51°50'N. 0°53'E. (Essex)	
	×		23.3.55	Assendelft : 52°28'N. 4°45'E. (N. Holland)	
<i>AF5847</i>		ad.	25.2.53	Abberton	
	+		25.9.55	<i>Nr.</i> Karlstad : 59°24'N. 13°32'E. (Varmland)	Sweden
<i>AF7905</i>		ad.	8.2.54	Abberton	
	+		5.11.55	Dybsø Fjord : 55°08'N. 11°47'E. (Sjaelland)	Denmark
<i>AF9450</i>		ad.	22.2.54	Abberton	
	+		28.1.55	Abbotsbury (Dorset) 170m. S.W.	
<i>AF9470</i>		ad.	2.3.54	Abberton	
	×		25.12.55	<i>Nr.</i> Sneek : 53°00'N. 5°42'E. (Friesland)	Holland
<i>AF9481</i>		ad.	5.3.54	Abberton	
	+		20.11.55	Dybsø Fjord (Sjaelland)	Denmark
<i>AF9492</i>		ad.	7.3.54	Abberton	
	×	<i>ca.</i>	7.11.55	<i>Nr.</i> Koscian : 52°05'N. 16°38'E. (Poznan)	Poland
<i>AF9502</i>		ad.	9.3.54	Abberton	
	×		29.1.55	Haren : 52°48'N. 7°15'E. (Niedersachsen)	Germany
<i>AF9529</i>		ad.	16.3.54	Abberton	
	+		7.12.54	Segeberg See : 53°58'N. 10°24'E. (Holstein)	Germany
<i>AH3780</i>		ad.	5.3.55	Abberton	
	×		15.6.55	L. Dabski : <i>ca.</i> 53°24'N. 14°40'E. (Szczecin)	Poland

**Oystercatcher (*Haematopus ostralegus*)**

346623	juv.	10.7.53	Fair Isle : 59°32'N. 1°37'W. (Shetland)
×		30.1.55	Fintra Bay, Killybegs (Donegal) 450m. S.W.
344187	O pull.	18.6.53	Fair Isle
×		19.1.55	Charlestown (Fife) 250m. S.S.W.
69584	O pull.	20.6.54	Craigellachie : 57°29'N. 3°09'W. (Banff). RP
×		9.4.55	Irvine (Ayrshire) 145m. S.W.
47110	O pull.	3.7.50	Dunlichity : 57°22'N. 4°13'W. (Inverness). ECMK
+		13.1.55	Clogherhead (Louth) 265m S.S.W.
66846	O pull.	25.5.52	Newtonmore : 57°04'N. 4°07'W. (Inverness). RP
+		20.2.55	Tralee Bay (Kerry) 400m. S.W.
69286	O pull.	30.5.53	Newtonmore. RP
+		7.3.55	Glin (Limerick) 370m. S.W.
69566	O pull.	23.5.54	Newtonmore. RP
×		13.3.55	Foulney I. (Lancs.) 215m. S.S.E.
58061	O pull.	31.5.53	Gladhouse Reservoir : 55°46'N. 3°08'W. (Midlothian). S&W
×		6.3.55	Barrow-in-Furness (Lancs.) 120m. S.
54283	O pull.	31.5.53	Skokholm : 51°42'N. 5°16'W. (Pembs.)
()		1.3.54	Ribadeo : 43°32'N. 7°01'W. (Lugo) <b>Spain</b>
74490	O pull.	1.7.54	Skokholm
()		4.1.55	Ile d'Oleron : 45°55'N. 1°15'W. (Charente-Maritime) <b>France</b>

**Lapwing (*Vanellus vanellus*)**

Fifty-seven recoveries, of which 14 were from abroad (12 France, 1 U.S.S.R., Spain), in the winter months. All the birds had been ringed, as "pullus", in N. England and Scotland. Seven birds from the same areas were reported from Ireland during the winter. All other recoveries showing movement greater than 50 miles are given.

53645	O pull.	1.6.54	Nr. Aviemore : 57°12'N. 3°50'W. (Inverness) PE
×		ca.18.4.55	Nr. Fort William (Inverness) 54m. S.W.
79539	juv.	13.7.54	Seahouses : 55°35'N. 1°39'W. (Northumb.). MHBO
×		ca.20.12.54	Nr. Dumfries. 82m. S.W.
50834	O pull.	17.6.51	Nr. Otley : 53°57'N. 1°43'W. (Yorks.). RFD
×		22.2.55	Port Isaac (Cornwall) 265m. S.S.W.
53805	O pull.	9.5.54	Nr. Cranborne : 50°55'N. 1°56'W. (Dorset) KBR
×		ca.1.3.55	Looe (Cornwall) 113m. W.S.W.
23331	O pull.	16.6.53	Nr. Clitheroe : 53°53'N. 2°24'W. (Lancashire). RMB
×		28.2.55	Nr. Solva (Pembs.). 180m. S.W.
3978	O pull.	11.6.55	Elsdon : 55°14'N. 2°6' W. (Northumb.). A&R
×		28.8.55	Glenfarg (Perthshire) 90m. N.W.
1189	O pull.	10.5.53	Litton : 54°10'N. 2°8'W. (Yorkshire). W&M
×		3.5.55	Loch Awe, Dalmally (Argyll.) 192m. N.W.

The following remarkable recovery, the first from the U.S.S.R., was reported 1954 but publication was withheld until the ring could be obtained.

0860	O pull.	12.6.47	Holy I : 55°42'N. 1°48'W. (Northumb.). " W "
/?/		28.4.52	Kivach : 62°15'N. 34°20'E. (Karelo-Finnish Republic) <b>U.S.S.R.</b>



**Ringed Plover (*Charadrius hiaticula*)**

W23460	O	pull.	30.6.55	Aviemore : 57°12'N. 3°50'W. (Inverness). L&R
	+		4.12.55	Gweedore (Donegal) 225m. S.W.
20335		juv.	24.7.54	Spurn Point : 53°35'N. 0°06'E. (Yorks.)
	×		4.2.55	Rhyl (Flint) 150m. W.S.W.

**Little Ringed Plover (*Charadrius dubius*)**

M9858	O	pull.	6.6.54	Guildford : 51°14'N. 0°35'W. (Surrey). B&T
	()		29.3.55	St. Bazeille : 44°32'N. 0°06'E. (Lot-et-Garonne) <b>France</b>

**Golden Plover (*Charadrius apricarius*)**

283955	O	pull.	21.6.55	St. John's Chapel : 54°44'N. 2°11'W. (Durham). A&R
	+		14.11.55	Nr. Hurst, Reeth (Yorks.) 28m. S.S.E.

**Turnstone (*Arenaria interpres*)**

S26161		ad.	30.8.55	Beadnell : 55°33'N. 1°37'W. (Northumb.). MHBO
	+		27.10.55	Nr. Libreville : 0°26'N. 9°25'E. <b>Gabon</b>
T3533		ad.	13.1.51	Wembury : 50°19'N. 4°04'W. Plymouth (Devon). HGH
	+		14.6.55	Nr. Slidre Fjord : ca. 80°00'N. 86°00'W. Ellesmere Island, <b>Canada</b>

In connection with these two remarkable recoveries, it may be added that a Turnstone ringed on Ellesmere Island in July 1955, as a nestling, was shot in Portugal on 11th September 1955. The single previous recovery of a Turnstone ringed in Britain was from West Greenland 72°15'N. 56°00'W. A fourth bird has been reported, from N.E. Greenland, in 1956.

**Snipe (*Capella gallinago*)**

W41731		ad.	28.8.55	Nr. Rugeley : 52°46'N. 1°55'W. (Staffs.). CBC
	+		24.11.55	Benavente : 38°58'N. 8°47'W. (Ribatejo) <b>Portugal</b>
X63669		ad.	10.8.53	Abberton : 51°50'N. 0°53'E. (Essex)
	+		29.8.54	Nr. Ans : 56°18'N. 9°35'E. (Jutland) <b>Denmark</b>
S11259		ad.♀	29.7.55	Abberton
	+		1.9.55	Niewkoop : 52°09'N. 4°46'E. (Z. <b>Holland</b> )
S33502		ad.	21.8.55	Abberton
	+		11.9.55	Ravels : 51°22'N. 5°00'E. (Antwerp) <b>Belgium</b>

**Curlew (*Numenius arquata*)**

363071	O	pull.	6.7.52	Stannington : 55°07'N. 1°39'W. (Northumb.). A&R
	+		3.1.55	Nr. Ballyhaunis (Mayo) 300m. W.S.W.
376049	O	pull.	29.6.54	Stannington. A&R
	+		10.2.55	Miltown Malbay (Clare) 350m. S.W.
374271	O	pull.	30.5.53	Appleby : 54°35'N. 2°30'W. (Westmorland). RWR
	+		12.1.55	Nr. Clonmellon (West Meath) 180m. W.S.W.
307080	O	pull.	18.6.55	Ingbirchworth : 53°33'N. 1°40'W. (Yorks.). JCSE
	+		25.9.55	Nr. Ardilly : 46°16'N. 1°02'W. (Charente-Maritime) <b>France</b>
340356	O	pull.	28.5.51	Chartley : 52°51'N. 1°59'W. (Staffs.). AHJ
	+		21.12.54	Triaize : 46°24'N. 1°12'W. (Vendée) <b>France</b>

**Common Sandpiper (*Tringa hypoleucos*)**

X84823		juv.	1.8.54	Abberton : 51°50'N. 0°53'E. (Essex)
	×		4.5.55	Pateley Bridge (Yorks.) 190m. N.W.

**Redshank (*Tringa totanus*)**

PB771	O	pull.	26.5.53	Nr. Kincaig : 57°08'N. 3°56'W. (Inverness).	FCG
	v		3.4.55	Nr. Reay (Caithness) 100m. N.	
X28944	O	pull.	3.7.55	Newtonmore : 57°04'N. 4°07'W. (Inverness).	RP
	×		18.9.55	Nr. Eastriggs (Dumfries.) 150m. S.	
X61805	O	pull.	12.6.55	Elsdon : 55°14'N. 2°06'W. (Northumb.).	A&R
	()		23.7.55	Noyelles : 50°11'N. 1°43'E. (Somme) <b>France</b>	
X59778	O	pull.	29.5.54	Burgh Marsh : 54°56'N. 3°03'W. (Cumb.).	RHB
	×		10.4.55	Nr. Castletown, Isle of Man, 85m S.W.	
X80545	O	ad. ♂	7.5.55	Nr. Blackburn : 53°47'N. 2°29'W. (Lancs.).	WGH
	×		3.11.55	Newlyn (Cornwall) 280m. S.W.	

**Spotted Redshank (*Tringa erythropus*)**

X51816	ad.	15.8.55	Nr. Rugeley : 52°46'N. 1°55'W. (Staffs.).	CBC
	()	4.9.55	St. Laurent-de-la-Salanque, Perpignan : 42°46'N. 2°59'E. (Pyrénées-Orientales) <b>France</b>	

**Knot (*Calidris canutus*)**

X55900	f.g.	28.8.53	Benacre : 52°24'N. 1°43'E. (Suffolk).	AGH
	×	0.9.54	Nr. Iwade (Kent) 80m. S.S.W.	

**Dunlin (*Calidris alpina*)**

X30880	juv.	13.8.55	Fair Isle : 59°32'N. 1°37'W. (Shetland)	
	+	(16.9.55)	Bassin d'Arcachon : 44°42'N. 1°10'W. (Gironde) <b>France</b>	
X59326	juv.	11.9.53	Cley : 52°58'N. 1°03'E. (Norfolk)	
	()	6.5.55	Triaize : 46°24'N. 1°12'W. (Vendée) <b>France</b>	
X84466		17.9.54	Beadnell : 55°33'N. 1°37'W. (Northumb.).	MHBO
	×	ca. 27.2.55	Nr. Liverpool (Lancs.). 160m. S.S.W.	

X30880 was identified as belonging to the Northern race *Calidris a. alpina*.

**Arctic Skua (*Stercorarius parasiticus*)**

X37524	O	pull.	17.7.53	Fair Isle : 59°32'N. 1°37'W. (Shetland)	
	+	ca.	10.8.55	Nissum Fjord : ca. 56°23'N. 8°12'E. (Jutland) <b>Denmark</b>	
X37606	O	juv.	3.7.50	Fair Isle	
	×		0.7.54	Papa Westray (Orkney) 48m. S.W.	

**Great Skua (*Stercorarius skua*)**

X06929	O	pull.	18.7.51	Fair Isle : 59°32'N. 1°37'W. (Shetland)	
	()	mid.	1.55	Bermeo : 43°26'N. 2°46'W. (Vizcaya) <b>Spain</b>	

**Great Black-backed Gull (*Larus marinus*)**

08985	ad.	27.10.54	Isle of May : 56°11'N. 2°33'W. (Fife)	
×	<i>ca.</i>	14.9.55	Nyksund : <i>ca.</i> 69°0'N. 15°15'E. Lofoten Is. <b>Norway</b>	
07830	O	pull.	15.7.51	Maughold Head : 54°18'N. 4°19'W. Isle of Man. CC&M
×		22.8.55	Fleetwood (Lancs.) 60m. S.E.	
11101	O	pull.	26.5.52	Lundy : 51°12'N. 4°40'W. (Devon)
×		18.3.55	R. Neath (Glam.) 45m. N.E.	

**Lesser Black-backed Gull** (*Larus fuscus*)

Twenty-four overseas recoveries may be analysed as follows :—

1	N. Spain
16	W. Spain and Portugal
3	Mediterranean Spain
4	Africa

Extreme dates are 3rd September—22nd March.

AH5929, details of which appear below, is the most southerly recovery so far recorded.

Of the 41 birds ringed as “pullus,” 27 were recovered in the 1st winter (ending 30th April), 6 in the second, and 3, 4, and 1 in the third, fourth and fifth seasons respectively.

All “home” recoveries over 75 miles are given below in full.

AH5929	O	pull	31.8.55	Farne Is. : 55°37'N. 1°37'W. (Northumb.). ND&N
	+		29.12.55	Nr. Freetown : 8°30'N. 13°10'W. <b>Sierra Leone</b>
AF8771	O	pull.	10.8.53	Farne Is. ND&N
	×	ca.	28.6.55	Nr. Rotherham (Yorkshire) 145m. S.
AF8698	O	pull.	22.8.53	Nr. Kippen : 56°8'N. 4°11'W. (Stirling.)
	×		0.6.55	Letton, Nr. Hereford. 290m. S.S.E.
AF7715		juv.	17.8.54	Seahouses : 55°35'N. 1°39'W. (Northumb.). MHBO
	×	ca.	18.7.55	Nr. Hamilton (Lanark.) 95m. W.N.W.
AF7992	O	pull.	1.8.53	Rockcliffe Marsh : 54°56'N. 2°59'W. (Cumberland). RHB
	×		14.9.55	Nr. Aberfeldy (Perthshire) 115m. N.N.W.
AF3409	O	pull.	31.7.54	Nr. Lancaster : 54°3'N. 2°48'W. (Lancashire). W&M
	×		(20.9.55)	Nr. Chippenham (Wiltshire) 175m. S.S.W.
AE8488	O	pull.	6.7.52	Nr. Lancaster. RFD
	×		29.5.55	Nr. Dingestow (Monmouth.) 160m. S.
AF6754	O	pull.	9.8.54	Farne Is. ND&N
	+		21.5.55	West Tanfield, Ripon (Yorks.) 120m. S.

**Herring Gull** (*Larus argentatus*)

AF9992	O	pull.	4.7.54	Newborough : 53°10'N. 4°22'W. (Anglesey). RPC
	×		0.10.54	Peterston Wentloog (Mon.) 125m. S.S.E.
AE9225	O	pull.	7.7.55	Gamrie Bay : 57°41'N. 2°21'W. (Banff.). WUF
	×		(22.8.55)	Nr. North Berwick (E. Lothian) 115m. S.
AE3598	O	pull.	25.6.55	Bodorgan : ca. 53°12'N. 4°27'W. (Anglesey). OOS
	×		(1.11.55)	Milford Haven (Pemb.) 100m. S.S.W.
AF8451	O	pull.	9.7.55	Nr. Rosemarkie : 57°36'N. 4°7'W. (Ross.). JL
	v		28.9.55	E. Kilbride (Lanark.) 135m. S.
AF6617	O	pull.	18.7.53	Bass Rock : 56°4'N. 2°38'W. (E. Lothian). MHBO
	()		30.3.55	Off Ardglass (Down) 170m. S.W.
409883		1stW.	21.3.55	Steep Holm : 51°21'N. 3°7'W. (Somerset) PJC
	×	ca.	30.9.55	Portmadoc (Caernarvon) 115m. N.W.
403580	O	pull.	9.7.52	Steep Holm
	()		10.1.55	Algeciras : 36°7'N. 5°26'W. (Cádiz) <b>Spain</b>



AF1497	O	pull.	29.6.53	Lundy : 51°12'N. 4°40'W. (Devon)
	/?/		17.2.55	Ile D'Oleron : 45°55'N 1°15'W. (Charente-Maritime) <b>France</b>
AH4726	O	pull.	5.6.55	Isle of Muck : 54°51'N. 5°44'W. (Antrim). RSD
	()		0.10.55	Off Figueira da Foz : 40°8' N. 8°50'W. (Beira Litoral) <b>Portugal</b>

Whilst special care was taken by the ringers to ascertain that the last three birds were Herring Gulls, in each case ringing was carried out at a colony where breeding Lesser Black-backed Gulls were also present, so that the chance of error, although small, is not fully precluded. There is, as yet, no recovery from southern France or Iberia of a Herring Gull ringed in an unmixed colony.

### Common Gull (*Larus canus*)

78883	O	pull.	1.7.53	L. Carrowmore : 54°12'N. 9°47'W. (Mayo). DFC
	v		31.1.55	Nr. Liselton (Kerry) 120m. S.
58194	O	pull.	5.7.54	L. Ashie : 57°23'N. 4°16'W. (Inverness.) ECMK
	×	ca.	22.3.55	Arbroath (Angus) 90m. S.E.
54771	O	pull.	9.6.54	L. Carra : 53°41'N. 9°14'W. (Mayo). DFC
	×	ca.	14.1.55	Kilfenora (Clare) 50m. S.

### Black-headed Gull (*Larus ridibundus*)

70451	O	pull.	3.6.54	Nr. Leuchars : 56°22'N. 2°53'W. (Fife). AC
	()		6.1.55	Carburn (Kildare) 265m. S.W.
242541	O	pull.	24.5.50	Nr. Leuchars. AC
	×		(28.11.55)	Stranraer (Wigtown.) 125m. S.W.
70375	O	pull.	3.6.54	Nr. Leuchars. AC
	×		20.2.55	Ballyheigue (Kerry) 400m. S.W.
63240	O	pull.	5.7.52	Ravenglass : 54°21'N. 3°25'W. (Cumberland) AEM
	()		3.3.55	Borrisokane (Tipperary) 210m. S.W.
56666	O	pull.	8.7.51	Ravenglass. AEM
	×		0.3.55	Nr. Irvine (Ayrshire) 100m. N.W.
86631	O	pull.	10.7.54	Nr. Cartmel : 54°12'N. 2°57'W. (Lancashire). ACW
	×		30.11.55	Ross-on-Wye (Herefordshire) 160m. S.
52744	O	pull.	22.6.55	Nr. Knottingley : 53°43'N. 1°14'W. (Yorkshire). RFD
	+		30.11.55	Omagh (Tyrone) 250m. W.N.W.
81160	O	pull.	13.6.54	Heptonstall Moors : 53°47'N. 2°1'W. (Yorkshire) W&M
	()		15.11.55	Nr. Noirmoutier : 47°1'N. 2°15'W. (Vendée) <b>France</b>
52666	O	pull.	28.6.53	Nr. Colne : ca. 53°50'N. 2°4'W. (Lancashire) RFD
	/?/		(22.11.55)	Kilcrohane : 51°35'N. 9°42'W. (Cork) 340m. W.S.W.
74374	O	pull.	26.6.55	Nottingham : 52°58'N. 1°10'W. HB
	×		(26.10.55)	Nr. Carlisle (Cumberland) 150m. N.W.
87688	O	pull.	25.6.54	Rhulen : 52°9'N. 3°16'W. (Radnor). PJC
	×		15.2.55	King's Lynn (Norfolk) 160m. E.N.E.
87829	O	pull.	20.6.55	Llangunllo : 52°20'N. 3°9'W. (Radnor) PJC
	×		16.10.55	Nr. Leeds (Yorkshire) 120m. N.E.
73135	O	pull.	20.6.54	Llangunllo. PJC
	×		11.2.55	Dungarvan (Waterford) 190m. W.
87652	O	pull.	22.6.54	Rhos-goch : 52°7'N. 3°11'W. (Radnor). PJC
	×		6.1.55	Wexford, 140m. W.
891251	O	pull.	18.7.54	Nr. Brightlingsea : 51°49'N. 1°2'E. (Essex). RWA
	×		6.6.55	Nr. Fouras : 45°59'N. 1°6'W. (Charente-Maritime) <b>France</b>

3004307	O	pull.	5.7.55	Nr. Brightlingsea. RWA
	×		(5.10.55)	Marchwood, Nr. Southampton (Hampshire) 120m. S.W.
391178	O	pull.	18.7.54	Nr. Brightlingsea. RWA
	×		ca.24.6.55	Nr. Salisbury (Wiltshire) 130m. S.W.
351207	O	juv.	9.7.50	Abberton : 51°50'N. 0°53'E. (Essex)
	×		30.3.55	Southampton (Hampshire) 115m. S.W.
351451		juv.	14.7.52	Abberton
	+		29.10.55	Paimpol : 48°47'N. 3°3'W. (Côtes-du-Nord) <b>France</b>
383319		1stW.	27.2.55	Chelmsford : 51°44'N. 0°28'E. (Essex). P&B
	×		7.9.55	Cresswell (Northumb.) 260m. N.W.
373732		ad.	ca.22.10.53	St. James's Park, London. LNHS
	+		7.6.55	Nr. Resenbro : 56°10'N. 9°39'E. (Jutland) <b>Denmark</b>
<i>Witherby</i>				
53438	O	pull.	4.7.54	Nr. Gillingham : 51°24'N. 0°34'E. (Kent). SES
	+		22.12.54	Nr. Guérande : 47°20'N. 2°25'W. (Loire-Inf.) <b>France</b>
3000211	O	pull.	5.6.55	Lough Beg : 54°56'N. 6°27'W. (Antrim). RSD
	()		(27.10.55)	Nr. Clonakilty (Cork) 240m. S.W.
390717	O	pull.	3.7.54	Copeland Is. : 54°40'N. 5°32'W. (Down). JAB
	×		19.1.55	Nr. Mitchelstown (Cork) 205m. S.W.
378662	O	pull.	19.6.55	Lough Derg : 54°37'N. 7°52'W. (Donegal). DFC
	×		(3.9.55)	Nr. Carrick-on-Suir (Tipperary) 160m. S.S.E.

**Kittiwake (*Rissa tridactyla*)**

367204	O	pull.	10.7.52	Farne Is. : 55°37'N. 1°37'W. (Northumb.). ND&N
	+	before	9.54	Fiskenaasset : 63°12'N. 51°W., S.W. <b>Greenland</b>
375141	O	pull.	25.6.53	Farne Is. ND&N
	()		ca. 1.6.54	Off Reykjanes, ca. 65°N. 27°30'W. <b>Iceland</b>
375512	O	pull.	16.7.53	Farne Is. ND&N
	+		7.2.55	Ricourt : 43°29'N. 0°12'E. (Gers) <b>France</b>
375450	O	ad.	13.6.54	Farne Is. ND&N
	×		ca. 24.3.55	Truro : 45°21'N. 63°14'W. <b>Nova Scotia.</b>
348491	O	pull.	2.7.54	South Shields : 55°N. 1°25'W. (Durham) JCC
	×		21.9.55	Footdee (Aberdeen) 150m. N.N.W.
3004835	O	pull.	18.7.55	Farne Is. ND&N
	/2/		15.11.55	Off Kerry : 51°45'N. 10°20'W.
3004834	O	pull.	18.7.55	Farne Is. ND&N
	×		14.11.55	Nr. Dornoch (Sutherland) 180m. N.W.
3004808	O	pull.	17.7.55	Farne Is. ND&N
	×		21.10.55	Querqueville : 49°40'N. 1°42'W. (Manche) <b>France</b>
384556	O	pull.	14.7.55	Farne Is. ND&N
	+		18.9.55	Juist : ca. 53°41'N. 7°01'E. E. Frisian Is. <b>Germany</b>
375034	O	pull.	14.7.55	Farne Is. ND&N
	v		5.11.55	Nr. Wedmore (Somerset) 310m. S.S.W.
384748	O	pull.	6.7.55	Farne Is. ND&N
	()		15.11.55	Castro-Urdiales : 43°24'N. 3°14'W. (Santander) <b>Spain</b>
388040	O	pull.	7.7.54	Farne Is. ND&N
	×		6.1.55	At sea : 46°48'N. 7°58'W.
382043		juv.	13.7.54	Marsden : 54°58'N. 1°22'W. (Durham). EW
	+		5.9.55	Nr. Jakobshavn : 69°15'N. 51°W. <b>Greenland</b>
376777	O	pull.	17.6.55	North Shields : 55°01'N. 1°26'W. (Northumb.). ND&N
	×		(18.8.55)	Outer Dowsing Lightship (off Lincs.) 125m. S.E.





Peter Beretzk

NEST OF MEDITERRANEAN BLACK-HEADED GULL (*Larus melanocephalus*)

SZEGED, HUNGARY, 1955

This appears to be quite a substantial nest, though typically built of any available vegetation roughly heaped together, with a few feathers in the lining. A clutch of 4 eggs is evidently not unusual, at least in Hungary (see page 73).



Peter Beretzk

YOUNG MEDITERRANEAN BLACK-HEADED GULLS (*Larus melanocephalus*)

SZEGED, HUNGARY, 1955

The Handbook does not give details of the juvenile plumage, so this photograph is particularly instructive. The birds appear to have paler crowns and mantles than young Black-headed Gulls (*L. ridibundus*) and the heavy, slightly down-curved bill is already conspicuous (see page 75).





Peter Beretzk

MEDITERRANEAN BLACK-HEADED GULLS (*Larus melanocephalus*): SZEGED, HUNGARY, 1955  
 Here two are nesting barely a couple of feet apart and between them can be seen a Black-headed Gull (*L. ridibundus*), so that there is a good comparison between the heads of the two species. While the latter has a chocolate brown hood, the Mediterranean Gull has the whole head jet black, this colour extending well down the nape. In addition, *melanocephalus* has a stouter and more down-curved bill (see page 74).





Peter Beretzk

MEDITERRANEAN BLACK-HEADED GULL (*Larus melanocephalus*): SZEGED, HUNGARY, 1955  
 Again Black-headed Gulls (*L. ridibundus*) can be seen in the background. The effect of the light in this photograph and the preceding one makes the bodies of the birds appear almost completely white, though the mantle, back, scapulars and wing-coverts are, in fact, blue-grey. The outstanding feature is, of course, the absence of black on the primaries; even these, however, are not pure white, but a pale frosty grey.





James Alder

DESERT WHEATEAR (*Oenanthe deserti*): CO. DURHAM, DECEMBER 1955  
This shows the sandy upper-parts, which colour extends on to the scapulars so that there is a smaller area of dark wing than in the Black-eared Wheatear (*Oe. hispanica*). The creamy-buff stripe above and behind the eye, and the dark throat, should also be noted here (see page 77).



James Alder

DESERT WHEATEAR (*Oenanthe deserti*): CO. DURHAM, DECEMBER 1955  
The upper side of the spread wing: the primaries and secondaries were brownish-black, with a buff edge along the outer webs (broader on the inner secondaries) and tips of the same colour.





James Alder

DESERT WHEATEAR (*Oenanthe deserti*): CO. DURHAM, DECEMBER 1955  
 Here one gets a good impression of the most striking features of the species—the black tail without the white sides to the base that is characteristic of most wheatears, and the off-white rump becoming greyer towards the tail (see page 78).



James Alder

DESERT WHEATEAR (*Oenanthe deserti*): CO. DURHAM, DECEMBER 1955  
 This shows the extent of the dark throat and also the grey-tipped black of the axillaries and under wing-coverts. The under-parts were pale sandy with a greyer tinge than the upper.



E. H. Ware

HYBRID TREE × HOUSE SPARROW (*Passer montanus* × *domesticus*)

DORSET, SEPTEMBER 1955

This bird clearly had a mixture of the characters of the two species and here one can compare the restricted black bib (nearer to *montanus*) with the slightly mottled, greyish-brown crown and the whitish-buff line above the lores, both of which recall *domesticus* (see page 79).



Eron Jones

HYBRID TREE × HOUSE SPARROW (*Passer montanus* × *domesticus*)

DORSET, SEPTEMBER 1955

Here one can note the shape of the bird: it was more slender than *domesticus* and its head and bill were comparatively small, more as in *montanus*. This also shows the two buffish-white wing-bars and the black patch on the ear-coverts, both of which are characteristic of *montanus*, though the ear-patch was ill-defined.



E. H. Ware

HYBRID TREE  $\times$  HOUSE SPARROW (*Passer montanus*  $\times$  *domesticus*)

DORSET, SEPTEMBER 1955

The general impression, at first glance, was of a Tree Sparrow and that is borne out here where the small bill, dark ear-patch, white collar and double wing-bar all suggest that species. The back and rump were yellowish-brown, with hardly any of the grey colour of *domesticus* (see page 79).



P. R. Clarke

HYBRID TREE  $\times$  HOUSE SPARROW (*Passer montanus*  $\times$  *domesticus*)

CLEY, APRIL 1956

This bird closely resembled *montanus* in general colour, including the restricted throat-patch and the black ear-mark, but, as is clearly shown here, it had a heavier bill than the Portland bird (above), as well as a really ashy-grey crown and only one wing-bar (in all these ways being closer to *domesticus*) (see page 80).





J. B. Bottomley

SNIPES (*Capella gallinago*) WITH ABNORMAL BILL: WESTMORLAND, JULY/AUGUST 1956  
 The up-curved bill, being in addition rather heavier than usual, produces the impression of an exaggerated Bar-tailed Godwit (*Limosa lapponica*). The mandibles were otherwise quite symmetrical and closed together perfectly; the bird itself appeared to be in good health and was able to feed quite normally (see page 75).

Common Tern (*Sterna hirundo*)

A17116	O	pull.	16.7.55	Rye Harbour : 50°56'N. 0°46'E. (Sussex). DBO
	×		18.9.55	Nr. Dordrecht : 51°44'N. 4°39'E. (Z-Holland)
X19824	O	juv.	12.7.55	Blakeney Point : 52°58'N. 1°1'E. (Norfolk). NNT
	×		6.9.55	St. Osyth, Nr. Clacton (Essex) 8om. S.

Sandwich Tern (*Sterna sandvicensis*)

276007	O	pull.	4.7.55	Farne Is. : 55°37'N. 1°37'W. (Northumb.) ND&N
	v		17.12.55	Off Mauritania : 19°14'N. 17°W.
276910	O	pull.	8.7.54	Farne Is. : ND&N
	+		3.4.55	Nr. Lagos : 6°25'N. 3°27'E. <b>Nigeria</b>
276680	O	pull.	8.7.54	Farne Is. : ND&N
	()		8.3.55	Nr. Keta : 5°54'N. 1°E. <b>Gold Coast</b>
272544	O	pull.	16.7.54	Farne Is. ND&N
	()		16.2.55	Winneba : 5°20'N. 0°38'W. <b>Gold Coast</b>
249796	O	pull.	25.7.52	Firth of Forth : ca. 56°10'N. 2°50'W. MOC
	+		28.1.55	Keta, <b>Gold Coast</b>
267517	O	pull.	3.7.52	Farne Is. ND&N
	+	winter	54/55	Keta Lagoon, <b>Gold Coast</b>
276925	O	pull.	8.7.54	Farne Is. ND&N
	()		ca.3.1.55	Nr. Keta, <b>Gold Coast</b>
281253	O	pull.	8.7.54	Farne Is. ND&N
	×		17.12.54	Abidjan : 5°16'N. 4°2'W. <b>Ivory Coast</b>

Razorbill (*Alca torda*)

A10480	O	?	ca.7.7.52	Lundy : 51°12'N. 4°40'W. (Devon)
	×		29.12.54	Nr. Maryport (Cumb.) 25om. N.N.E.
4116376	O	pull.	1.7.53	Skokholm : 51°42'N. 5°16'W. (Pembs.)
	[?]		6.12.53	Nr. Vigo : ca. 42°14'N. 8°40'W. (Pontevedra) <b>Spain</b>
A17400	O	pull.	27.6.52	Skokholm
	[?]		ca.20.4.55	Barcelona : 41°22'N. 2°10'E. <b>Spain</b>
A19303	O	pull.	24.6.52	Lundy
	[?]		22.11.52	Valencia : 39°29'N. 0°20'W. <b>Spain</b>
4122169	O	pull.	6.7.54	Skokholm
	×		4.3.55	Douarnenez Bay : ca. 48°05'N. 4°20'W. (Finistère) <b>France</b>
4129316	O	pull.	26.6.55	Skokholm
	()		(10.11.55)	Off Cherrueix : 48°36'N. 1°40'W. (Ille-et-Vilaine) <b>France</b>
A118770	O	pull.	29.6.55	Lundy
	×		27.11.55	Nr. Kircubbin (Down) 23om. N.
4123255	O	ad.	2.7.54	Skokholm
	×		(19.11.55)	Nr. Taulé : 48°36'N. 3°55'W. (Finistère) <b>France</b>
4118387	O	pull.	13.7.54	Lundy
	×		10.12.55	Fuenterrabia : 43°23'N. 1°46'W. (Guipúzcoa) <b>Spain</b>

Guillemot (*Uria aalge*)

A129506	O	pull.	5.7.55	Grassholm : 51°44'N. 5°29'W. (Pembs.) SBO
	×		12.12.55	Shoreham (Sussex) 23om. E.S.E.
A126521	O	pull.	26.6.55	Isle of May : 56°11'N. 2°33'W. (Fife)
	+		2.12.55	Nr. Arendal : 58°27'N. 8°56'E. (Agder) <b>Norway</b>



AT22967	O	pull.	30.6.54	Bardsey I. : 52°46'N. 4°48'W. (Caernarvon)
	×		(22.11.55)	Nr. Inverness 330m. N.
AT18562	O	pull.	8.7.55	Lundy : 51°12'N. 4°40'W. (Devon)
	×		(17.8.55)	Penmarch : 47°49'N. 4°20'W. (Finistère) <b>France</b>
AE2273	O	pull.	3.7.52	Nr. Peterhead : 57°23'N. 1°51'W. (Aberdeen) HNS
	+		0.2.55	Nr. Fredrikstad : 59°12'N. 10°58'E. (Östfold) <b>Norway</b>
AT22964	O	pull.	30.6.54	Bardsey I.
	×		26.12.54	Walney I. (Lancs.) 115m. N.E.
AT18601	O	ad.	9.7.54	Lundy
	×		ca.11.2.55	St. Mary's, Scilly Is. (Cornwall) 110m. S.W.

### Puffin (*Fratercula arctica*)

AT23642	O	pull.	13.7.54	Skokholm : 51°42'N. 5°16'W. (Pemb.)
	×		16.2.55	Cap-Breton : 43°38'N. 1°26'W. (Landes) <b>France</b>
AX9975	O	pull.	9.7.55	Farne Is. : 55°37'N. 1°37'W. (Northumb.) ND&N
	×		11.12.55	Nr. Wick (Caithness) 200m. N.N.W.
AT15765	O	ad.	5.6.53	Skokholm
	×		(31.10.55)	Nr. Pléneuf : 48°35'N. 2°32'W. (Côtes-du-Nord) <b>France</b>

### Woodpigeon (*Columba palumbus*)

326086	O	pull.	18.8.45	Mortimer : 51°22'N. 1°3'W. (Berks.) GFD
	+		7.3.55	Grazeley (Berks.) 2m. N.E.
360799	O	pull.	17.7.55	Cookham : 51°34'N. 0°42'W. (Berks.) RFT
	×		31.12.55	Nr. Pont-Croix : 48°4'N. 4°35'W. (Finistère) <b>France</b>
363042	O	pull.	30.9.51	Blagdon : 55°5'N. 1°39'W. (Northumb.) A&R
	+		11.2.55	Nr. York 78m. S.S.E.

### Cuckoo (*Cuculus canorus*)

268149		juv.	23.7.55	Walberswick : 52°18'N. 1°41'E. (Suffolk) DBC
	+		5.9.55	Nr. Port-Jerome : 49°28'N. 0°32'E. Lillebonne (Seine-Maritime) <b>France</b>
246885		ad.♂	6.5.55	Fair Isle : 59°32'N. 1°37'W. (Shetland)
	+		12.5.55	Valestrandsfossen : 60°30'N. 5°25'E. Nr. Bergen, <b>Norway</b>

This bird was first *seen* at Valestrandsfossen on 8.5.55.

### Barn Owl (*Tyto alba*)

AD9174	O	pull.	16.7.54	Nr. Sheffield : 53°23'N. 1°29'W. (Yorks.) SNHS
	×		ca.24.3.55	Epping Forest (Essex) 135m. S.E.

### Little Owl (*Athene noctua*)

368829	O	pull.	18.6.54	Goxhill : 53°41'N. 0°20'W. (Lincs.) HVDB
	×		ca.2.6.55	Handsworth, Sheffield, (Yorks.) 47m. S.W.

### Long-eared Owl (*Asio otus*)

AF6099	O	juv.	3.5.53	Ross Links : 55°37'N. 1°47'W. Nr. Belford (Northumb.) MHBO
	×		(26.7.55)	Lucker (Northumb.) 5m. S.E.

### Short-eared Owl (*Asio flammeus*)

AN1579	O	pull.	2.7.52	Nr. Barr : 55°13'N. 4°33'W. (Ayrshire) GHH
	×		ca.14.5.55	Nr. Tarsset, Hexham (Northumb.) 90m. E.
AH2230	O	pull.	6.7.55	Tairlaw : 55°16'N. 4°31'W. Straiton (Ayrshire) GHH
	×		26.8.55	Dumfries 35m. S.E.



**Swift (*Apus apus*)**

B310795	ad.	8.7.54	Ewell Court : 51°22'N. 0°16'W. (Surrey) B&T
×		17.5.55	Downe, Farnborough (Kent) 14m. E.
A50639	f.g.	9.6.55	St. Osyth : 51°48'N. 1°5'E. (Essex) RWA
v		26.6.55	Stow Bridge, King's Lynn (Norfolk) 62m. W.N.W.
A450620	f.g.	9.6.55	St. Osyth. RWA
×		20.6.55	Newmarket (Suffolk) 41m. N.W.

**Skylark (*Alauda arvensis*)**

A15046	f.g. ♂	25.1.55	Dungeness Lighthouse : 50°55'N. 0°59'E. (Kent)
[?]		16.5.55	Kvernaland : ca. 58°44'N. 5°40'E. (Rogaland) <b>Norway</b>
B357167	ad.	2.2.54	Micheldever : 51°9'N. 1°16'W. (Hampshire) DJ
()		5.5.54	Off Rauma : 61°8'N. 21°33'E. <b>Finland</b>

**Swallow (*Hirundo rustica*)**

A650	juv.	15.8.54	Reay : 58°30'N. 3°45'W. (Caithness) JMG
×		4.2.55	Magogong : ca. 27°40'S. 24°47'E. (Cape Province) <b>South Africa</b>
B38606	O pull.	23.8.54	Nr. Scarborough : 54°14'N. 0°35'W. (Yorkshire) AW
×		2.12.54	Luisa : 7°32'S. 22°32'E. (Kasai) <b>Belgian Congo</b>
B35598	O pull.	11.7.53	Nr. Sedbergh : 54°19'N. 2°32'W. (Yorkshire) SS
×		3.6.55	Ireby (Cumberland) 37m. N.W.
A129101	ad.	5.5.55	Great Saltee : 52°07'N. 6°35'W. (Wexford)
×		10.5.55	Off Ile de Groix : 47°38'N. 3°26'W. (Morbihan) <b>France</b>

Movement 350 miles S.S.E. in May.

B398084	O pull.	24.6.55	Sipson : 51°29'N. 0°27'W. (Middlesex) B&T
×		23.9.55	Pointis-Inard : 43°6'N. 0°49'E. (Haute Garonne) <b>France</b>

**Sand Martin (*Riparia riparia*)**

A168811	juv.	24.8.55	Nr. Knaresborough : 54°4'N. 1°28'W. (Yorkshire) JASB
×		(25.9.55)	Nr. Aigurande sur Bouzanne : 46°26'N. 1°50'E. (Indre) <b>France</b>

**Raven (*Corvus corax*)**

A08052	O pull.	16.4.54	Minnigaff : 54°58'N. 4°28'W. (Kirkcudbright.) DAR
+		ca. 27.4.55	Innerleithen (Peebles) 65m. N.E.
A08818	O pull.	9.4.54	Belford : 55°36'N. 1°49'W. (Northumb.) MHBO
×		ca. 15.5.55	Nether Warden, Hexham (Northumb.) 44m. S.S.W.

**Jay (*Garrulus glandarius*)**

A88312	O pull.	2.6.55	Wytham : 51°47'N. 1°19'W. (Berks.) EGI
+		22.11.55	Hockley Heath, Birmingham (Warwicks.) 45m. N.N.W.

**Chough (*Pyrrhocorax pyrrhocorax*)**

A82561	O pull.	23.6.54	Ballynalacken Castle : 53°3'N. 9°19'W. (Clare) CM
+		(6.11.55)	Inverin (Galway) 14m. N.N.W.

**Great Tit (*Parus major*)**

B15437	ad. ♀	17.12.54	Brenzett : 51°1'N. 0°52'E. Romney Marsh (Kent) DBO
v.		28.3.55	Sevenoaks (Kent) 32m. N.W.

**Blue Tit (*Parus caeruleus*)**

A15412	ad	11.4.55	Dungeness : 50°55'N. 0°59'E. (Kent)
×		(20.12.55)	Fontaine-sur-Somme : 50°2'N. 1°56'E.
			Nr. Hallencourt (Somme) <b>France</b>
B92574	f.g.	27.12.54	Kenton : 51°35'N. 0°18'W. (Middlesex) AGH
×		21.4.55	Salfords, Redhill (Surrey) 25m. S.S.E.
B78016	ad.	6.3.55	Dorney : 51°31'N. 0°39'W. (Bucks.) BH
()		24.3.55	Haslemere (Surrey) 28m. S.
NX433	ad.	13.2.55	Bourton-on-the-Water : 51°52'N. 1°44'W. (Gloucester- shire) MHR
×		16.3.55	Maidenhead (Berkshire) 45m. S.E.
A17223	ad.	27.11.54	Purley : 51°21'N. 0°6'W. (Surrey) LNHS
×		ca.27.6.55	Nr. Lurgashall (Sussex) 32m. S.W.
B29246	ad.	14.1.55	Brent Knoll : 51°16'N. 2°57'W. (Somerset) EGH
×		12.9.55	Leigh, Nr. Reigate (Surrey) 118m. E.
A22746	f.g.	16.4.55	Aylsham : 52°48'N. 1°16'E. (Norfolk) CLM
×		(21.10.55)	North Creak, Fakenham (Norfolk) 23m. W.N.W.
B77899	ad.	13.3.55	Cookham : 51°34'N. 0°42'W. (Berks.) JF
×		5.12.55	Leatherhead (Surrey) 25m. S.E.

**Coal Tit (*Parus ater*)**

FI681	ad.	20.12.49	Camberley : 51°21'N. 0°44'W. (Surrey) RSB
v		1.3.50	ibid.
×		28.5.55	ibid.

**Wren (*Troglodytes troglodytes*)**

B23767	O	pull.	7.7.54	Ayston : 52°36'N. 0°42'W. Uppingham (Rutland) US
×			1.11.55	Kettering (Northants.) 13m. S.

**Mistle Thrush (*Turdus viscivorus*)**

X52223	O	pull.	24.5.53	Byrness : 55°19'N. 2°22'W. Redesdale (Northumb.) ND&N
×			ca.7.12.55	Moir (Down) 180m. W.S.W.
277624	ad.		11.2.55	Harrogate : 53°59'N. 1°33'W. (Yorks.) AFGW
+			(5.12.55)	Martley, Nr. Worcester. 128m. S.S.W.
266581	ad.		26.1.55	Nr. Burton-on-Trent : 52°48'N. 1°37'W. (Staffordshire) BA
×			13.6.55	Nr. Lancaster (Lancashire) 85m. N.W.

**Fieldfare (*Turdus pilaris*)**

231347	1stW.	18.11.54	Great Saltee : 52°7'N. 6°35'W. (Wexford)
()		17.8.55	Brattvåg : 62°36'N. 6°27'E. (More) <b>Norway</b>
X62909	ad.	19.2.55	Goxhill : 53°41'N. 0°20'W. (Lincs.) HVDB
+		30.7.55	Ål : 60°38'N. 8°35'E. (Buskerud) <b>Norway</b>

**Song Thrush (*Turdus philomelos*)**

PJ522	ad.	27.10.51	Fair Isle : 59°32'N. 1°37'W. (Shetland)
×		ca.7.12.54	Belmonte de Miranda : 43°18'N. 6°13'W. (Asturias) <b>Spain</b>
X31524	f.g.	15.2.53	Sandwich Bay : 51°17'N. 1°20'E. (Kent) DFH
×		17.3.55	Houten : 52°3'N. 5°10'E. (Utrecht) <b>Holland</b>
PR248	1stW.	19.10.52	Gibraltar Point : 53°6'N. 0°21'E. (Lincolnshire)
+		5.3.54	Cabra : 37°29'N. 4°26'W. (Cordoba) <b>Spain</b>

R7765	1stW.	22.10.52	Fair Isle (Shetland)
×		14.10.55	Nr. Hilleröd : 55°56'N. 12°19'E. (Sjælland) <b>Denmark</b>
X86281	O pull.	30.4.55	Fradswell : 52°52'N. 1°25'W. Nr. Stafford AHJ
+		(26.10.55)	Amares : 41°35'N. 8°20'W. Nr. Braga (Minho) <b>Portugal</b>
X96431	f.g.	10.10.55	Isle of May : 56°11'N. 2°33'W. (Fife)
+		24.12.55	Nr. Guarda : 40°38'N. 7°34'W. (Beira Baixa) <b>Portugal</b>
X43470	juv.♀	12.5.53	Avoch : 57°34'N. 4°10'W. (Ross.) JL
v		20.1.55	Collooney (Sligo) 295m. S.W.
X51310	O pull.	12.6.54	Windle : 53°27'N. 2°45'W. Nr. St. Helens (Lancashire) KH
×		ca.24.12.54	Athboy (Meath) 170m. W.
X55694	O pull.	25.4.54	Nr. Woodstock : 51°51'N. 1°22'W. (Oxfordshire) C&C
×		2.2.55	Musbury (Devon) 110m. S.W.
PS054	O pull.	27.4.54	Kennington : 51°44'N. 1°16'W. (Berkshire) MTM
×		13.3.55	Nr. Swansea (Glamorgan) 120m. W.
W25103	f.g.	14.8.55	Loanhead : 55°52'N. 3°9'W. (Midlothian) S&W
×		(24.11.55)	Cahir (Tipperary) 305m. S.W.
X12357	ad.	14.12.52	Dublin : 53°20'N. 6°15'W. SMDA
×		ca.25.5.55	Preston (Lancashire) 147m. E.N.E.
X44498	ad.	31.1.54	Rathfarnham : 53°18'N. 6°18'W. (Dublin) RGW
×		9.5.55	Ford (Northumb.) 235m. N.E.

Six Song Thrushes ringed by A. E. Male at Old Colwyn : 53°17'N. 3°41'W., (Denbighshire) between 17.1.55 and 28.2.55 were recovered in the same year as follows :—

March :	Warwickshire, 110m. S.E.	Staffordshire, 86m. S.E.
July :	Denbighshire, 18m. E.S.E.	Yorkshire, 95m. N.E.
August :	Cheshire, 60m. E.N.E.	
December :	Denbighshire, 14m. E.S.E.	

### Redwing (*Turdus musicus*)

S19587	f.g.	15.10.55	Walberswick : 52°18'N. 1°41'E. (Suffolk) DBC
+		ca.22.12.55	Nr. Viseu : 40°41'N. 7°55'W. (Beira Alta) <b>Portugal</b>
20362	f.g.	3.10.54	Spurn Point : 53°35'N. 0°6'E. (Yorks.)
+		19.11.55	Nr. Cadillac : 44°42'N. 0°21'W. (Gironde) <b>France</b>
29155	f.g.	13.10.53	Isle of May : 56°11'N. 2°33'W. (Fife)
+		23.3.55	Nr. Verteuil : 45°59'N. 0°14'E. (Charente) <b>France</b>
PX909	f.g.	19.10.52	Isle of May
×		24.2.55	Leverington, Nr. Wisbech (Cambridgeshire) 255m. S.S.E.
X38672	1stW.	25.10.53	Lundy : 51°12'N. 4°40'W. (Devon)
()		ca.22.12.54	Malmédy : 50°26'N. 6°2'E. (Liège) <b>Belgium</b>

### Ring Ouzel (*Turdus torquatus*)

X65089	O pull.	8.5.54	Nr. Keighley : 53°55'N. 1°53'W. (Yorkshire) N&L
+		0.12.54	Nr. Manzanera : ca. 40°4'N. 0°55'W. (Teruel) <b>Spain</b>

### Blackbird (*Turdus merula*)

X30434	1stW.♂	23.10.54	Fair Isle : 59°32'N. 1°37'W. (Shetland)
×		16.1.55	Nr. Oban (Argyll.) 260m. S.W.
X29654	ad.♂	3.11.53	Fair Isle
()		(13.12.55)	Forres (Morayshire) 150m. S.S.W.
X65773	f.g.	27.10.54	Isle of May : 56°11'N. 2°33'W. (Fifeshire)
/?/		(15.11.55)	Newton Stewart (Wigtownshire) 110m. S.W.



XL699	ad.♀	6.10.49	Isle of May
v		19.3.55	Normanton (Yorkshire) 175m. S.
R597I	f.g.♂	12.10.52	Isle of May
×		27.12.54	Campbeltown (Argyll.) 130m. W.S.W.
X6648I	f.g.♂	8.2.54	Scarborough : 54°17'N. 0°24'W. (Yorkshire) AW
×		(20.11.55)	Seascale (Cumberland) 122m. W.
X94267	ad.	17.3.55	Old Colwyn : 53°17'N. 3°41'W. (Denbighshire) AEM
×		28.3.55	Ryhill, Nr. Wakefield (Yorkshire) 104m. N.E.
V8817	f.g.♂	18.3.54	Castletown : 54°4'N. 4°39'W., Isle of Man. CC&M
×		8.2.55	Nr. Llandudwyn (Denbighshire) 105m. S.E.
X71748	ad.	21.6.54	Chelmsford : 51°44'N. 0°28'E. (Essex) P&B
×		19.11.55	Chagford (Devon) 200m. W.S.W.
SI6608	1stW.♀	17.10.55	Ilkley : 53°56'N. 1°49'W. (Yorkshire) WNS
+		19.11.55	Hossegor : 43°39'N. 1°25'W. (Landes) <b>France</b>
X92752	f.g.♀	18.10.55	Spurn Point : 53°35'N. 0°6'E. (Yorkshire)
( )	ca.22.2.56		Gijon : 43°33'N. 5°40'W. (Asturias) <b>Spain</b>
W37366	ad.♂	18.10.55	Dungeness : 50°55'N. 0°59'E. (Kent)
+		27.12.55	Nr. Marquina : 43°17'N. 2°29'W. (Vizcaya) <b>Spain</b>
W37389	f.g.♂	21.10.55	Dungeness
/?/		17.11.55	Biarritz : 43°29'N. 1°33'W. (Basses-Pyrénées) <b>France</b>

The recoveries from southern France(2) and Spain(2) are unprecedented. Prior to the winter of 1955-1956 Morbihan was the most southerly area from which our ringed Blackbirds had been reported and there were, in all, only five records from France. It will be noted that the four birds concerned were all trapped between 17th and 21st October, 1955.

(NOTE.—Publication of X92752 has been advanced a year to show the recovery in its context).

Sixty-three birds were recovered abroad, or in Ireland, as follows :—

TABLE G—COUNTRY AND MONTH OF RECOVERY OF BLACKBIRDS (*Turdus merula*)

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
NORWAY (18) ... ..	4	2	1			2	4				4	1
SWEDEN (9*) ... ..							3	1		1	3	
DENMARK (5) ... ..	1						3			1		
GERMANY (6) ... ..		1			1	2			2			
HOLLAND (2) AND BELGIUM (4) ... ..	1			1			2	1	1			
FRANCE (4) AND SPAIN (2)		2	1	1	1	1						
IRELAND (13) ... ..			1	6	5	1						

\* One bird reported for "summer" is excluded from the table. See also footnote on Mallard.

The birds were ringed in the following months :—October, 27 ; November, 18 ; December, 2 ; January, 4 ; February, 3 ; March, 7 ; April, 2, most of them when passing through the bird observatories.

TABLE H—AREA OF RINGING AND COUNTRY OF RECOVERY OF BLACKBIRDS (*Turdus merula*)

	IRELAND	FRANCE AND SPAIN	BELGIUM AND HOLLAND	GERMANY	DENMARK	SWEDEN	NORWAY
SCOTLAND ... ..	5				2	2	11
N. E. ENGLAND ... ..	5	2		1	2	4	3
IRISH SEA ... ..	2			2	1		2
E. ENGLAND ... ..	1	1	3	1		2	2
S. ENGLAND ... ..		3	3	2		1	

**Wheatear (*Oenanthe oenanthe*)**

A61453	1stW.	21.8.55	Fair Isle : 59°32'N. 1°37'W. (Shetland)
×		25.8.55	Nethybridge (Inverness.) 175m. S.W.
B89026	juv.	13.7.55	Fair Isle
×		3.9.55	Nr. Stone (Staffordshire) 460m. S.
A61262	1stW.	10.8.55	Fair Isle
()		(9.10.55)	Azuaga : 38°16'N. 5°39'W. (Badajoz) <b>Spain</b>
B89074	juv.	9.7.55	Fair Isle
×		ca.7.10.55	Campillos : 37°2'N. 4°52'W. (Malaga) <b>Spain</b>
A61804	1stW.	1.9.55	Fair Isle
×		24.9.55	Vera de Moncayo : 41°48'N. 1°42'W. (Zaragoza) <b>Spain</b>
This was identified as <i>leucorrhoa</i> (wing 101, tail 59; weight 31.03 gm.).			
B33509	O pull.	8.6.54	Crook : 54°21'N. 2°50'W. Nr. Kendal (Westmorland)
			JWA
	[?]	10.9.54	Nr. Soria : 41°47'N. 2°28'W. <b>Spain</b>
A33974	juv.	26.7.55	Skokholm I. : 51°42'N. 5°16'W. (Pemb.)
×		28.9.55	Zarza de Alange : 38°49'N. 6°12'W. (Badajoz) <b>Spain</b>

**Whinchat (*Saxicola rubetra*)**

A55991	f.g.	1.9.55	Dungeness : 50°55'N. 0°59'E. (Kent)
()		10.10.55	Nr. Tudela : 42°05'N. 1°36'W. (Navarra) <b>Spain</b>
B13895	juv.	10.9.53	Dungeness
×		(12.9.55)	Nr. Bordeaux : 44°50'N. 0°34'W. (Gironde) <b>France</b>
B69694	ad.	31.8.55	Spurn Point : 53°35'N. 0°6'E. (Yorks.)
×		(23.9.55)	Nr. Lagoa : 37°9'N. 8°24'W. (Algarve) <b>Portugal</b>
A11066	f.g.♂	30.4.55	Isle of May : 56°11'N. 2°33'W. (Fife)
()		15.9.55	Nr. Estella : 42°42'N. 2°2'W. (Navarra) <b>Spain</b>
B23802	O pull.	18.6.53	Sabden : 53°51'N. 2°20'W. (Lancashire) JJB
×		ca.11.4.55	Between Stafford and Wolverhampton, ca. 80m. S.

**Redstart (*Phoenicurus phoenicurus*)**

JN024	O pull.	17.6.54	Llanwnog : 52°32'N. 3°27'W. (Montgomeryshire) PJC
()		24.9.55	Casablanca : 33°39'N. 7°35'W. <b>Morocco</b>
A15199	f.g.♂	9.4.55	Dungeness : 50°55'N. 0°59'E. (Kent)
×		12.5.55	Nr. Longframlington (Northumb.) 320m. N.N.W.

**Robin (*Erithacus rubecula*)**

B41823	ad.	15.7.54	Reading : 51°27'N. 0°58'W. (Berks.) LPS
v		ca.11.1.55	Nr. Sittingbourne (Kent) 72m. E.

MK213	f.g.	27.10.51	Isle of May : 56°11'N. 2°33'W. (Fife)
	×	25.2.55	Tattershall (Lincolnshire) 230m. S.S.E.
MB936	f.g.	4.10.51	Spurn Point : 53°35'N. 0°6'E. (Yorks.)
	/?/	3.1.55	Rouillac : 45°47'N. 0°4'W. (Charente) <b>France</b>
LPo67	ad.	22.8.52	Great Saltee : 52°7'N. 6°35'W. (Wexford)
	v	ca.7.1.55	Ballyheigue Castle (Kerry) 135m. W.
	v	2.5.55	ibid.
LA246	f.g.	31.12.52	Ewell : 51°21'N. 0°15'W. (Surrey) B&T
	×	20.4.55	Whitehill, Borden (Hampshire) 31m. S.W.

### Reed Warbler (*Acrocephalus scirpaceus*)

A69167	f.g.	8.9.55	Spurn Point : 53°35'N. 0°6'E. (Yorks.)
	+	13.10.55	Nr. Lisbon : 38°44'N. 9°7'W. <b>Portugal</b>

### Sedge Warbler (*Acrocephalus schoenobaenus*)

A32197	ad.	21.4.55	Dungeness : 50°55'N. 0°59'E. (Kent)
	×	ca.26.6.55	Chislet, Nr. Canterbury (Kent) 30m. N.N.E.

### Blackcap (*Sylvia atricapilla*)

A12288	ad.♀	6.5.55	Cley : 52°58'N. 1°3'E. (Norfolk)
	×	11.6.55	Great Snoring, Fakenham (Norfolk) 37m. S.W.
B96395	f.g.	19.9.54	Sandwich Bay : 51°17'N. 1°20'E. (Kent) DFH
	×	19.5.55	Iver (Buckinghamshire) 81m. W.N.W.

### Garden Warbler (*Sylvia borin*)

B54469	f.g.	21.8.54	Spurn Point : 53°35'N. 0°6'E. (Yorks.)
	()	16.5.55	Heligoland : 54°9'N. 7°52'E. <b>Germany</b>

### Whitethroat (*Sylvia communis*)

B95256	juv.	10.9.54	Gibraltar Point : 53°6'N. 0°21'E. (Lincolnshire)
	×	ca.22.5.55	Kirby Moorside (Yorkshire) 93m. N.W.
B95271	ad.	12.9.54	Gibraltar Point
	/?/	17.9.55	Frades de la Sierra : 40°41'N. 5°47'W. (Salamanca) <b>Spain</b>
A12038	ad♂	27.4.55	Cley : 52°57'N. 1°3'E. (Norfolk)
	v	22.5.55	Bradwell-on-Sea (Essex) 83m. S.
B24854	juv.	19.8.53	Abberton : 51°50'N. 0°53'E. (Essex)
	×	2.10.54	Abambres : 41°34'N. 7°11'W. Nr. Mirandela (Tras os Montes) <b>Portugal</b>
A71501	ad.	14.8.55	Sandwich Bay : 51°17'N. 1°20'E. (Kent) DFH
	/?/	(13.9.55)	Monforte de Lemos : 42°31'N. 7°30'W. (Lugo) <b>Spain</b>
DI350	juv.	14.8.52	Dungeness : 50°55'N. 0°59'E. (Kent) LNHS
	×	30.6.55	Nr. Retford (Nottinghamshire) 190m. N.N.W.
B47963	f.g.	4.8.54	Dungeness
	×	7.9.55	Nr. Monforte de Lemos : 42°31'N. 7°30'W.
A55005	f.g.	4.9.55	Dungeness
	×	15.9.55	Cap Ferret : 44°42'N. 1°16'W. (Gironde) <b>France</b>

### Lesser Whitethroat (*Sylvia curruca*)

B31944	juv.	20.7.54	Cholsey : 51°34'N. 1°9'W. (Berkshire) OOS
	×	ca.14.4.55	Nachlat : 32°02'N. 34°53'E. Yehud, <b>Israel</b>



**Willow Warbler** (*Phylloscopus trochilus*)

4135509	juv.	6.8.55	Bardsey I. : 52°46'N. 4°48'W. (Caernarvon.)	
	+	25.8.55	Nr. La Tranche : 46°21'N. 1°26'W. (Vendée)	France
H507	ad.	6.5.53	Dungeness : 50°55'N. 0°59'E. (Kent)	
	×	21.8.55	Dolphinton (Peebles) 380m. N.W.	
12379	ad.	6.5.55	Cley : 52°57'N. 1°3'E. (Norfolk)	
	×	11.6.55	Nr. Dollar (Clackmannanshire) 290m. N.W.	

**Chiffchaff** (*Phylloscopus collybita*)

36907	f.g.	27.9.55	Portland Bill : 50°31'N. 2°27'W. (Dorset)	
	+	ca.1.11.55	Castanheira de Pera : 40°0'N. 8°10'W. Nr. Coimbra (Douro)	Portugal
31935	f.g.	1.8.55	Romford : 51°35'N. 0°11'E. (Essex)	AGH
	×	22.10.55	Casablanca : 33°39'N. 7°35'W.	Morocco
50084	f.g.	27.8.55	Great Saltee : 52°07'N. 6°35'W. (Wexford)	
	()	14.10.55	Nr. Satão : 40°45'N. 7°42'W. Castendo (Beira Alta)	Portugal
41009	ad.	29.3.54	Dungeness : 50°55'N. 0°59'E. (Kent)	
	×	31.3.55	Perranporth (Cornwall) 270m. S.W.	

**Spotted Flycatcher** (*Muscicapa striata*)

35202	O	pull.	16.6.55	Wytham : 51°47'N. 1°19'W. (Berkshire)	EGI
	()		11.9.55	Puerto de Santa Maria : 36°36'N. 6°12'W. (Cádiz)	Spain
4632	1stW.		6.9.51	Skokholm I. : 51°42'N. 5°16'W. (Pemb.)	
	/?		21.8.54	Pamplona : 42°50'N. 1°38'W. (Navarra)	Spain

**Pied Flycatcher** (*Muscicapa hypoleuca*)

35628	f.g.	24.8.55	Bardsey I. : 52°46'N. 4°48'W. (Caernarvon.)	
	/?	ca.9.9.55	Fundão : 40°9'N. 7°31'W. (Coimbra)	<b>Portugal</b>
3266	O	pull.	9.6.54	Parkend : 51°46'N. 2°33'W. (Gloucestershire) C&C
	+		2.10.55	Pedrogão Grande : 39°56'N. 8°9'W. (Beira Baixa) <b>Portugal</b>

**Dunnoek** (*Prunella modularis*)

6310	t.g.	2.9.54	Chessington : 51°21'N. 0°19'W. (Surrey)	LNHS
	×	10.4.55	Highgate, London, 16m. N.N.E.	

**Meadow Pipit** (*Anthus pratensis*)

4701	O	pull.	18.5.55	Appleby : 54°35'N. 2°30'W. (Westmorland)	RWR
	/?		7.12.55	Nr. Ourique : 37°42'N. 8°18'W. (Alentejo)	Portugal
9084	juv.		11.7.55	Fain Isle : 59°32'N. 1°37'W. (Shetland)	
	+		ca.22.10.55	Bidart : 43°26'N. 1°35'W. (Basses-Pyrénées)	France
5527	f.g.		15.10.55	Dungeness : 50°55'N. 0°59'E. (Kent)	
	×		5.11.55	Falaise : 48°54'N. 0°11'W. (Calvados)	France
4867	1stW.		6.9.55	Nr. Seahouses : 55°35'N. 1°39'W. (Northumb.)	MHBO
	×		9.10.55	Nr. Libourne : 44°53'N. 0°16'W. (Gironde)	France
674	1stW.		12.9.51	Skokholm I. : 51°42'N. 5°16'W. (Pemb.)	
	×		31.10.54	Nr. Arcachon : 44°42'N. 1°12'W. (Gironde)	France
8550	f.g.		17.9.54	Fair Isle.	
	/?		ca.18.11.54	Nr. Casablanca : 33°39'N. 7°35'W.	Morocco
8690	juv.		11.8.54	Nr. Seahouses	MHBO
	+		12.10.54	Anglet : 43°29'N. 1°31'W. (Basses-Pyrénées)	France

B78469	juv.	5.7.54	Seahouses MHBO
v		ca.21.12.54	Nr. Lisbon : 38°44'N. 9°7'W. <b>Portugal</b>
KE365	O pull.	16.7.52	Sabden : 53°51'N. 2°20'W. (Lancs.) JJB
×		(22.3.55)	Evora : 38°33'N. 7°54'W. (Alentejo) <b>Portugal</b>
A67526	ad.	26.9.55	Abberton : 51°50'N. 0°53'E. (Essex)
+		23.10.55	Mimizan Plage : 44°12'N. 1°14'W. (Landes) <b>France</b>

### Rock Pipit (*Anthus spinoletta*)

B88206	juv.	18.8.54	Fair Isle : 59°32'N. 1°37'W. (Shetland)
×		ca.19.4.55	Buchan Ness (Aberdeenshire) 150m. S.
JC758	juv.	12.7.54	Fair Isle
×		ca.24.1.55	Canisbay, Nr. Duncansby (Caithness) 80m. S.W.

### Pied Wagtail (*Motacilla alba yarrellii*)

A52341	juv.	22.7.55	Abberton : 51°50'N. 0°53'E. (Essex)
()		23.10.55	Zumaya : 43°19'N. 2°15'W. (Guipúzcoa) <b>Spain</b>
LB634	juv.	4.8.52	Halifax : 53°43'N. 1°51'W. (Yorkshire) HSS
×		9.1.53	Evora : 38°33'N. 7°54'W. (Alentejo) <b>Portugal</b>
B78546	juv.	15.7.54	Nr. Seahouses : 55°35'N. 1°39'W. (Northumberland) MHBO
×		24.1.55	Sherburn-in-Elmet (Yorkshire) 125m. S.

### White Wagtail (*Motacilla alba alba*)

A59431	juv.	6.9.55	Nr. Kingsbridge : 50°12'N. 3°42'W. (Devon) CS
×		(7.11.55)	Ericeira : 38°59'N. 9°25'W. (Estremadura) <b>Portugal</b>

### Yellow Wagtail (*Motacilla flava flavissima*)

B24216	juv.	12.7.53	Abberton : 51°50'N. 0°53'E. (Essex)
+		2.10.55	Nr. Odemira : 37°35'N. 8°37'W. (Alentejo) <b>Portugal</b>

### Red-backed Shrike (*Lanius collurio*)

X90988	juv.	23.7.55	Walberswick : 52°18'N. 1°41'E. (Suffolk) DBC
()		28.8.55	" Sandettie " Light Vessel : 51°13'N. 1°54'E. Straits of Dover, 80m. S.S.E.

### Starling (*Sturnus vulgaris*)

W19424	juv.♂	26.9.54	Knaresborough : 54°0'N. 1°27'W. (Yorkshire) JRM
+		16.6.55	Presteigne (Radnor) 137m. S.W.
X69070	juv.	27.6.54	Westleton : 52°16'N. 1°35'E. (Suffolk) DBC
×		2.6.55	Nr. Pulborough (Sussex) 125m. S.W.
X28660	juv.	21.7.53	Abberton : 51°50'N. 0°53'E. (Essex)
v		9.10.55	Oostakker : 51°6'N. 3°46'E. (E. Flanders) <b>Belgium</b>
W29700	juv.	3.6.55	Betchworth : 51°14'N. 0°16'W. (Surrey) LNHS
×		(27.7.55)	Nr. Arras : 50°20'N. 2°51'E. (Pas-de-Calais) <b>France</b>
X57258	juv.	15.5.54	Chessington : 51°21'N. 0°18'W. (Surrey) LNHS
×		ca.15.2.55	Estaires : 50°39'N. 2°44'E. (Nord) <b>France</b>
X40053	ad.♂	14.2.53	West Wycombe : 51°39'N. 0°48'W. (Bucks.) RFT
v		ca.0.6.54	Priekule : ca. 55°35'N. 21°20'E. <b>Lithuanian S.S.R.</b>
×		18.3.55	Klaipeda : 55°42'N. 21°10'E. <b>Lithuanian S.S.R.</b>

Ninety-one Starlings ringed in the winter months were recovered abroad as follows :—

TABLE I—COUNTRY AND MONTH OF RECOVERY OF STARLINGS (*Sturnus vulgaris*)

	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
FRANCE (1) AND BELGIUM (6) ... ..							2	3	2			
HOLLAND (17) ... ..	4	4			1	1	1			1	2	3
DENMARK (11) ... ..	1	2	1	2	1	1	1				2	
NORWAY (7) AND SWEDEN (7) ... ..	6	4			3							1
GERMANY (21) AND POLAND (2) ... ..	2	4		4	1	2	3				2	5
FINLAND (2) AND U.S.S.R. (17) ... ..	9	5			2	1						2

NOTE :—This table includes X40053, which is published in full above. See also footnote on Mallard.

The months of ringing for these birds were :—October 7, November 5, December 7, January 27, February 31 and March 14. The seven birds ringed in October were trapped on Smith's Knoll Lightship, 52°43'N. 2°18'E., (2) ; at Hungeness Lighthouse, (4) and at Spurn Point, (1) and it would appear that trapping methods which rely on food are of limited value in the early part of winter. Of more than 750 birds ringed and recovered in this country only about a hundred were recovered more than 25 miles from the place of ringing.

### Greenfinch (*Chloris chloris*)

91572	ad.	26.2.55	Nr. Duns : 55°46'N. 2°20'W. (Berwicks.) WM
×	ca.	7.5.55	Morpeth (Northumb.) 47m. S.E.
49737	ad.♀	30.10.53	Seahouses : 55°35'N. 1°39'W. (Northumb.) MHBO
v		4.6.55	Chester-le-Street (Durham) 50m. S.
4700	ad.♂	21.2.53	Seahouses. MHBO
×		26.5.55	Retford (Nottinghamshire) 160m. S.S.E.
4932	f.g.♂	31.1.52	Seahouses. MHBO
×		15.5.55	Nr. Haltwhistle (Northumb.) 50m. S.W.
37301	f.g.♂	15.2.53	Seahouses. MHBO
×		7.5.55	Nr. Cheadle (Staffordshire) 180m. S.

### Goldfinch (*Carduelis carduelis*)

94668	1stW.	16.11.54	Great Saltee : 52°07'N. 6°35'W. (Wexford)
×		5.5.55	Nr. Buttevant (Cork) 86m. W.

### Linnet (*Carduelis cannabina*)

39893	f.g.♂	23.4.54	Abborton : 51°50'N. 0°53'E. (Essex)
+		17.3.55	Sore : 44°20'N. 0°35'W. (Landes) <b>France</b>
39794	f.g.♀	1.4.54	Abborton
v		20.2.55	Izegem : 50°56'N. 3°13'E. (W. Flanders) <b>Belgium</b>
32511	O pull.	10.6.55	Appleby : 54°35'N. 2°30'W. (Westmorland) RWR
()		26.10.55	Nr. Biarritz : 43°26'N. 1°35'W. (Basses-Pyrénées) <b>France</b>
E796	ad.♂	2.5.52	Cley : 52°57'N. 1°03'E. (Norfolk)
+		(5.12.55)	Souprosse : 43°47'N. 0°42'W. (Landes) <b>France</b>
36973	f.g.♀	4.10.55	Portland Bill : 50°31'N. 2°27'W. (Dorset)
×		20.10.55	Nr. Tartas : 43°50'N. 0°48'W. (Landes) <b>France</b>
46740	O pull.	6.6.54	Cley
/2/		22.10.54	Línea de la Concepción : 36°10'N. 5°19'W. (Cádiz) <b>Spain</b>



**Twite** (*Carduelis flavirostris*)

B68917	O	pull.	20.6.54	Nr. Halifax : 53°43'N. 1°51'W. (Yorks.)	N&L
	v		19.3.55	Nr. Colchester (Essex)	170m. S.E.

**Greenland Redpoll** (*Carduelis flammea rostrata*)

B65265	f.g.	15.9.55	Foula : 60°8'N. 2°7'W. (Shetland)	CKM
	v	12.10.55	Sundraquoy, Unst (Shetland)	55m. N.E.

**Chaffinch** (*Fringilla coelebs*)

LB803	ad.♀	5.3.52	Sandymount : 53°20'N. 6°13'W. (Dublin)	SMDA
	v	3.11.55	Spurn Point (Yorkshire)	260m. E.
JJ661	ad.♀	30.11.52	Grantham : 52°54'N. 0°38'W. (Lincs.)	L&R
	×	29.12.54	Nr. Antwerp : 51°20'N. 4°30'E.	Belgium
B91300	f.g.♂	15.1.55	Abberton : 51°50'N. 0°53'E. (Essex)	
	v	22.10.55	Nr. St. Niklaas : 51°10'N. 4°9'E. (F. Flanders)	Belgium
A21849	ad.♂	19.3.55	Nr. Brentwood : 51°38'N. 0°18'E. (Essex)	RS
	v	23.10.55	Zonnebeke : 50°52'N. 3°0'E. (W. Flanders)	Belgium
A24167	f.g.♂	23.2.55	Romford : 51°35'N. 0°11'E. (Essex)	AGH
	()	10.10.55	Gullegem : 50°51'N. 3°12'E. (W. Flanders)	Belgium
B44889	ad.♂	13.12.53	Sandwich Bay : 51°17'N. 1°20'E. (Kent)	DFH
	()	15.11.54	Koksijde : 51°6'N. 2°39'E. (W. Flanders)	Belgium
Ar2930	fg.♀	18.3.55	Dungeness : 50°55'N. 0°59'E. (Kent)	
	×	0.5.55	Le Touquet : 50°32'N. 1°36'E. (Pas-de-Calais)	France

**Brambling** (*Fringilla montifringilla*)

B55055	ad.	31.10.54	Spurn Point : 53°35'N. 0°6'E. (Yorks.)	
	×	22.10.55	Wanfercee-Baulet : 50°28'N. 4°35'E. (Hainaut)	Belgium
B35216	f.g.♀	24.2.54	Nr. Cley : 52°57'N. 1°03'E. (Norfolk)	
	()	26.10.54	Heist-op-den-Berg : 51°4'N. 4°44'E. (Antwerp)	Belgium

**Reed Bunting** (*Emberiza schoeniclus*)

A65073	f.g.	10.9.55	Walberswick : 52°18'N. 1°41'E. (Suffolk)	DBC
	×	19.11.55	Iken (Suffolk)	12m. S.W.

Very few Reed Buntings have been recovered and this is the second longest movement yet recorded.

**Snow Bunting** (*Plectrophenax nivalis*)

Br8909	f.g.	2.3.54	Spurn Point : 53°35'N. 0°6'E. (Yorks.)	
	v	21.2.55	ibid.	
Br8926	f.g.	22.3.54	Spurn Point	
	v	20.2.55	ibid.	

**House Sparrow** (*Passer domesticus*)

BR396	O	pull.	23.6.54	St. Osyth : 51°48'N. 1°5'E. (Essex)	RWA
	×		18.3.55	Cooling Marsh (Kent)	30m. S.W.

# PHOTOGRAPHIC STUDIES OF SOME LESS FAMILIAR BIRDS

## LXXVIII. MEDITERRANEAN BLACK-HEADED GULL

Photographed by PETER BERETZK

(Plates 9-11)

WE are fortunate to be able to publish this month photographs from Hungary of the Mediterranean Black-headed Gull (*Larus melanocephalus*) taken by Dr. Peter Beretzk of the University of Szeged. Dr. Beretzk has also been kind enough to give us some details of the discovery and history of the breeding of this bird in Hungary, which represents a considerable extension of its range.

Until recently the Black-headed Gull (*Larus ridibundus*) was the only gull breeding in Hungary. The Mediterranean Black-headed Gull occurred only on migration, but perhaps more commonly than is known, because it is thought that in winter plumage it may have been confused with the Black-headed. As an indication of origin, a bird ringed in the Dnieper delta on 2nd July 1948 was recovered on 19th August 1949 on Lake Balaton.

In 1940 in a colony of Black-headed Gulls, M. Vasvári found 2 downy young which from their unusual size and colouration he thought were Mediterranean Black-headed Gulls, but they were burnt with the collection of the Hungarian Institute of Ornithology before they were definitely identified. In the same colony of Rëtszilas (about 20 miles east of Lake Balaton) a clutch was found on 28th May 1950 which proved to be eggs of the Mediterranean Black-headed Gull.

In July 1953 Dr. Beretzk found at Szeged White Lake two chicks of large size and greyish brown colour—quite different from the surrounding young Black-headed Gulls—in a gull colony of more than a thousand pairs. On this occasion it was impossible for him in this quantity of gulls to locate the parents, and therefore he could not identify them. In 1954 he paid particular attention to this colony, and was able to collect an adult Mediterranean Black-headed Gull; later he saw two pairs which had bred, but their nests could not be found. The next year, 1955, he again found 2 pairs, with nests each containing 4 eggs, one of which was collected on 6th May. In this same nest were 3 new eggs on 2nd June. The two pairs were breeding about 2 feet apart in this big colony of Black-headed Gulls, and even on the water they associated closely with the great flock of *ridibundus*.

In 1956 he found a nest with 4 eggs and saw only one pair till 20th May when a second nest held one egg, so again two pairs bred in the colony of many hundred gulls. Thus the last four years show that the Mediterranean Black-headed Gull has become a regular breeding-bird in Hungary.

Before its establishment in east-central Europe, the bird's breeding range has been restricted to parts of Turkey, the north and west shores of the Black Sea (in the Crimea region and Dnieper delta, and the Danube delta), and north and central Greece where it is fairly common. The bird is a partial migrant, some remaining within the breeding-range in winter, but it also spreads westwards through the Mediterranean, reaching the coasts of east Spain and of the Bay of Biscay (N. Mayaud, *Alauda*, 1954, vol. 22, pp.225-245). Stray birds have travelled as far north as Denmark and west Germany, and in 1935 one remained to summer in a gullery in Holland, mated to a Black-headed Gull. In this last connection, A. L. J. van IJzendoorn (*The Breeding-Birds of the Netherlands*, 1950) adds: "It is said that a second pair was breeding there in the same year and also that the species bred already in this place in 1934 and 1933".

Until recently the Mediterranean Black-headed Gull was a very rare vagrant to this country, *The Handbook* listing only about 10 occurrences, but in the last few years there have been several records, while in 1955 and 1956 one or two birds have remained in East Anglia for considerable spells during summer, raising the question whether the westward extension of breeding could possibly be carried a good deal further. Nesting has been suspected in the past in southern Spain, but not proved.

The adult in winter plumage has been well illustrated and described (*antea*, vol. xlvii, plate 31 and pp. 217-218) by R. A. Richardson. He was forcibly struck by this gull's exquisite pearliness when seen on the wing for the first time. The salient features were the complete absence of black on the wing tips, and the lack of the dead white leading edge, so prominent in *ridibundus*. In addition the wings were decidedly blunter, broader and less angular. The white head was relieved by a dark mark behind each eye. In size the bird came between *ridibundus* and the Common Gull (*Larus canus*)—a stockier bird in flight than the Black-headed Gull, and it sat rather lower and less alertly on the water.

In summer plumage (plates 10 and 11) the bird becomes black-headed, but unlike the Black-headed Gull which acquires a chocolate brown hood, the head of the Mediterranean Black-headed Gull is jet black in summer, and the black extends as far down the back of the neck as it does at the front. There is a broken white ring round the eye, perhaps a little more conspicuous than that of the Black-headed Gull. Otherwise the plumage differences between the two species are the same as in winter. The bill and legs are brighter red than the Black-headed Gull's; the bill is stouter and more downcurved, a dusky band near the tip is inconspicuous.

First-winter birds are best picked out by wing pattern; in this plumage the young Mediterranean Black-headed Gull has most of the primaries dark brown, so that the leading part of the outer



wing is dark where in Black-headed Gulls it is distinctively white at all ages. We have seen no description of the juvenile, but the photograph on plate 9 (lower) suggests that among other differences it lacks the pale brown cap of the Black-headed Gull and has a paler mantle. Breeding habitat is salt and fresh lagoons and marshes, and as plate 9 (upper) shows, the nest and its surroundings resemble those of the Black-headed Gull. In winter it appears to be chiefly a coastal species. P.A.D.H.

## NOTES

**Snipe with abnormal bill.**—On 25th July 1956, at Crook, near Kendal, Westmorland, I took a photograph (see plate 16) of a female Snipe (*Capella gallinago*) with an up-curved bill. The bird was incubating four eggs in a grass tussock in low-lying, swampy ground about 75 yards from a small reservoir: I first saw the nest on 23rd July. Apart from being up-curved, the bird's bill seemed quite normal except for being somewhat "heavier": the colour was the usual pale brown shading to dark brown at the tip; the two mandibles were otherwise quite symmetrical and closed together perfectly. The bird itself appeared to be in good health and was able to feed quite normally. Three of the four eggs hatched on 5th August and there was no hint of abnormality in the nestlings.

J. B. BOTTOMLEY

**Black-headed Gulls feeding on hawthorn berries.**—On 5th October 1956, whilst driving along the roadway that borders Altrincham Sewage Farm, Cheshire, I observed a party of Black-headed Gulls (*Larus ridibundus*) holding into the wind, immediately above a thick hawthorn hedge. Noticing their attempts to land on the topmost branches, I stopped alongside, expecting to see them feeding on flies, which is done regularly at this time. I found out, however, that they were plucking the berries and eating them. At first I thought that they were possibly playing with them, but they regularly swallowed them after plucking them. They occasionally perched for a second or so whilst pulling the fruit, and the wings were then kept fully extended in order to take the weight off the frail branches. There were approximately 10 birds engaged in this task and I watched for 20 minutes. The bushes were heavily laden with large fleshy berries. R. HARRISON

[A record of Black-headed Gulls plucking and eating acorns was published in *British Birds*, vol. xlviii, p. 331.—EDS.]

**Turtle Doves sun-bathing.**—On 22nd June 1955, a pair of Turtle Doves (*Streptopelia turtur*) alighted on the bird-bath which stands on a pedestal in the centre of my lawn, at Tadworth, Surrey, and

after each had bathed in the water, they sat down side by side on the grass beneath the bath. Both birds then proceeded to sun-bathe, the wings being raised alternately and held almost at right-angles to the back. They remained for about half an hour, and during their stay sun-bathing occurred several times. Although Turtle Doves have frequented my garden annually for over twenty years, on no other occasion have I witnessed similar behaviour. John Gibb, in a paper on this subject (*antea*, vol. xl, pp. 172-174) was able to cite only one record comparable to the above, namely, T. R. E. Southwood's account of a Woodpigeon (*Columba palumbus*).  
HOWARD BENTHAM

**Behaviour of Bee-eater, Grey Wagtail and Starling with dragon-flies.**—I have already recorded (*antea*, vol. xlviii, p. 459) a case of the Robin (*Erithacus rubecula*) feeding its young with damselflies of the species *Ischnura elegans* from which the wings were not removed. I have since observed three further species of birds taking *Odonata* and a comparison of their behaviour is interesting.

Whilst watching the Bee-eaters in Sussex on 24th August 1955, I saw one of the adults catch a specimen of the large hawk dragonfly *Aeshna cyanea* in flight. The bird returned to its perch on some telegraph wires where it sat for some minutes repeatedly tossing the dragonfly into the air and catching it by the head, but making no attempt to remove the wings. Eventually it flew off towards the nesting-site still carrying the dragonfly by the head.

On 16th July 1956, by the River Frome near Bindon Abbey, Dorset, I watched a female Grey Wagtail (*Motacilla cinerea*) catch a Banded Agrion (*Agrion splendens*), remove the four wings one by one and feed the body head first to one of the juveniles that were accompanying her.

At Aldenham Reservoir, Hertfordshire, on 29th July 1954, I saw a number of adult and juvenile Starlings (*Sturnus vulgaris*) perching on some bushes by an extensive area of sedges, into which they descended in pursuit of the swarms of damselflies *Ischnura elegans*. These insects were eaten on the spot head first, complete with wings. The *Handbook* (Vol. I, p. 42) does not list *Odonata* amongst the food of this species.

BRYAN L. SAGE

[Dragonflies were not infrequently caught by the Sussex Bee-eaters, and the behaviour described above is typical of what happened on those occasions. Yet Mr. D. F. Owen found the remains of only four dragonflies (all apparently Aeshnidae) in the pellets and one complete Emperor Dragonfly (*Anax imperator*) was discovered beneath one of the nest-holes—which suggests that these insects were either eaten chiefly by the adults or usually fully dissected before being taken to the young.—I.J.F.-L.]

**Swallows apparently feeding on torpid flies.**—At 12.00 hours on 29th July 1956, at Freckleton Marsh in Lancashire, we noted

Swallows (*Hirundo rustica*) repeatedly hovering over and alighting on thistles (*Cirsium arvense*) that were growing in a dense bed on a dyke top. We watched them for a time, and then as we walked closer about 60 birds rose clear from the bed and dispersed, flying low over the marsh. Examining the thistles we saw there were many small Diptera (species unknown) in a torpid state, resting in the flowers, and we concluded that the Swallows had been feeding or attempting to feed on these.

Considering the date, the weather was extremely cold, a strong west wind was blowing and rain occurred frequently. This weather had extended over several days, resulting in few insects being seen. Accordingly it seemed probable that, because of the insect shortage, the Swallows were having to resort to unusual means of obtaining food.

NOEL CURRIER and MICHAEL HOWORTH

**Song Thrush breeding in October.**—On 11th October 1956, at Alnwick, Northumberland, I discovered a Song Thrush's (*Turdus philomelos*) nest containing 4 eggs; this was in an evergreen shrub in my garden. The bird was sitting on the nest the next day, and on the day following (the 13th) the eggs were still warm, although I did not see the adult then. By the 18th, however, it was quite clear that the nest had been deserted. W. S. CRASTER

**Desert Wheatear in Co. Durham.**—From 4th to 18th December 1955 a male Desert Wheatear (*Oenanthe deserti*) was watched by many observers on Jarrow Slake, which lies on the boundary between South Shields and Jarrow, Co. Durham; there is no previous record of this species in the county and it appears to be the twelfth for Britain. The Slake is a tidal mud-flat of 130 acres on the River Tyne, in a completely industrialized area; there are extensive timber-yards on its eastern and southern sides, and its edges are little more than heaps of slag and ash where small patches of grass and weeds maintain a sickly existence.

On 4th December D. Watson visited the area and saw what he felt confident was a "wheatear", but of a species other than *Oe. oenanthe*; he immediately reported the occurrence to the writer. D.W.'s accurate description and field-sketches, along with reference to the account of the Desert Wheatear near Halifax in 1949-50 (*antea*, vol. xliii, pp. 179-183), led to the surmise that the bird was of that same species and prompted an immediate return to Jarrow Slake, but during the whole of that afternoon it was not seen. However, on 5th December A. Nelson and D.W. had very close views of the rare visitor; and on the 6th the writer also saw it well, concluding that it was indeed a Desert Wheatear. During the next twelve days the identification was confirmed by the following, who saw the bird as a result of the kind permission granted by Mr. G. H. Brown, the manager of the timber-yard:—G. W. Temperley, Dr. H. M. S. Blair, Mr. and Mrs. T. H. Alder, J. Alder, A. Baldrige, B. Little, A. Blackett, L. Holloway,



J. H. Arthur, P. Stead, A. Jones, R. Lowe, M. Bell, Mrs. Martin, Dr. Barnes, Dr. Spence, A. Frizzell and J. Frizzell.

In the field the bird was perhaps slightly smaller than *Oe. oenanthe*, but resembled it in shape and carriage, as it did also in its characteristic actions. Since it seemed unperturbed by the noisy bustle of the timber-yard or by the presence of the watchers, remarkably close views were obtained and the following is a summary of the main plumage details:

The crown, neck and dorsal area were a sandy-brown, the wings being the same colour with an edge of black which broadened on the black primaries. In good light this black was seen to have a brownish cast about it, and the buff edges to the dark feathers were noticeable. There was a small patch of very pale sandy colour, almost white, in the carpal region. The underparts were pale sandy with a greyer tinge than the upper-parts, shading to grey under tail-coverts. A noticeable head-on feature was an orange tinge on the breast plumage. The head-pattern was distinctive, with the yellowish-buff superciliary stripe, more prominent behind the eye, and the dark feathers of the ear-coverts, malar region, chin and throat. At a distance this area of dark feathers appeared uniform dull grey, but closer views showed that there was an admixture of black streaks and patches. The most diagnostic feature was the tail, very different from that of *Oe. oenanthe*, since the black area extended almost up to the rump, which showed in flight merely as a paler grey area instead of a white patch.

It called very infrequently and then only a subdued "tehuk". One of its characteristics was its frequent hovering, seen by J. Alder on one occasion as high as about 10 feet. A pile of pit-props was often used as a perch, as were stones and, less frequently, the dry stems of mugwort.

On 17th December the bird was trapped; and it was then ringed, examined in detail by J. Alder, T. H. Alder and the writer, and photographed before being released. A copy of the plumage description taken when the bird was in the hand has been sent to *British Birds* with this note, and four of the photographs taken by J. Alder are reproduced on plates 12 and 13. The bird had a warm buff tone on the back and scapulars and this led us to believe that it was of the western race (*Oe. d. homochroa*); while the definitely brown appearance of the tail and remiges seemed strong evidence for distinguishing the bird as a first-winter male.

On 18th December the ringed bird was seen hunting diligently for food, but apparently with little success, in the nooks and crannies of the bank edging the Slake. Presumably it was hunting for spiders, though on one previous occasion it had been seen to resort to pulling a worm from the ground. A. Baldrige noted that it was repeatedly opening its beak without emitting any sound. Fears were expressed about its survival, the weather at the time being very severe, with snow lying and temperatures as low as 26.1°F, and the bird was in fact not seen after the 18th by any reliable observer, so far as is known. FRED G. GRAY

**Unusual nest-site of Sedge Warbler.**—On 13th May 1956, I found a typical Song Thrush's (*Turdus philomelos*) nest, contain-

ing one egg, in the centre of a bramble patch by the Cotgrave Canal, Nottinghamshire. When, on 27th May, I looked again at this nest, I was surprised to see that the whole cup was taken up with what proved to be a Sedge Warbler's (*Acrocephalus schoenobaenus*) nest, ready for eggs; to fill the cup of the thrush's nest it was, of course, an unusually bulky structure. On 10th June I flushed an adult Sedge Warbler from this nest which now held five eggs.

A. LEAVESLEY

**Crossbills feeding on elm leaves.**—On 6th July 1956, in Tore woods near Troup Head, Banffshire, I watched a party of Crossbills (*Loxia curvirostra*) which were probably immigrant birds. Cock, hen and three immatures were feeding in wych elm trees in mixed woodland. The birds were first seen in trees bearing no fruits, feeding on the leaves. With considerable dexterity, each leaf was rolled up from the side by bill and claws, and held by both feet. The leaf "pancake" was then partly eaten, after which a new leaf was rolled up. Later the birds in turn flew to a neighbouring elm, thickly laden with fruits, and fed on the samaras, while a shower of the paper-thin edges floated down to the ground.

WINIFRED U. FLOWER

**Hybrid Tree × House Sparrow in Dorset.**—On the morning of 27th September 1955, Dr. J. F. Monk and I saw a single bird which we both thought, at first glance, was a Tree Sparrow (*Passer montanus*), at the mouth of a Heligoland trap at Culverwell, Portland Bill, Dorset. We caught it, and immediately saw that the centre of the crown (forehead to nape) was greyish-brown, slightly mottled, unlike the normal uniform chocolate-coloured crown of a Tree Sparrow. Detailed examination at the Observatory, including direct comparison with a male House Sparrow (*Passer domesticus*), revealed the following features and established beyond doubt that it was a hybrid between the two species:— Most of crown feathers tipped greyish-buff, partly concealing reddish-brown (or chocolate) sub-terminal (central) patches, hence the mottled appearance shown in the photographs (plates 14 and 15, upper); sides of crown, above eye, more uniform reddish-brown (*cf.* broader uniformly greyish crown of male *domesticus*); whitish-buff line above lores (as *domesticus*); minute creamy-white "spot" just above and behind eye (smaller than in *domesticus*); ear-coverts greyish-white with rather ill-defined black patch on lower third (no black visible in *domesticus*). Restricted, almost triangular black patch on chin and throat; rest of under-parts mainly greyish-white, considerably cleaner and paler than in *domesticus*. Back, rump and upper tail-coverts yellowish-brown, hardly grey at all (*cf.* greyish with brown tinge in *domesticus*). Whitish band on side of neck, almost to midline on nape, more extensive and conspicuous than in *domesticus*. Two pale wing-bars, of almost equal width and prominence, were a

distinctive feature, compared with the single broader and whiter wing-bar of the male House Sparrow; on close inspection the buffish-white tips of the median coverts were slightly wider and paler than those of the greater coverts, corresponding fairly closely in these respects with the skins of Tree Sparrows subsequently examined. Compared with male *domesticus*, its head and bill looked considerably smaller and its body more slender. Weight, 21.1 gm.; wing, 73.5 mm.

*Discussion.*—Examination of skins in the British Museum (Natural History) fully confirmed our opinion that this bird had a mixture of the specific characters of *montanus* and *domesticus* (male), and none of those diagnostic of other *Passer* species. One skin (B.M. Reg. No. 1909.8.11.1) of a cage-bred hybrid *P. montanus* (♂) × *domesticus* (♀) was very like the Portland bird in crown and wing-bar characters (intermediate between *montanus* and ♂ *domesticus*, but much closer to the former, particularly the wing-bars); unfortunately this specimen was too damaged for useful comparison of other characters. Mr. A. A. Prestwich (*in litt.*) kindly informs me that there have been no recent reports of successful hybridization between the two species in captivity, and that the possibility that such a hybrid might be an escaped bird is very remote. He cites several old records of captive hybrid Tree × House Sparrow, including a report that Rosslyn Mannering bred about 12 in 1907, of which the males resembled young Tree Sparrows and the hens young House Sparrows (A. Silver, *Avic. Mag.*, 1911, p. 352). Information about the reverse cross is less precise, but W. Meise (*Bonn. Zool. Beitr.*, vol. 2, 1951, pp. 85-98) describes a young captive hybrid *domesticus* × *montanus*, sexed as female, intermediate between juveniles of the two species, but apparently closer to House than Tree Sparrow. As Mr. B. L. Sage has kindly pointed out (*in litt.*), there have been at least three previous British records of apparently wild hybrids between House and Tree Sparrows (*antea*, vol. xiii, pp. 136 and 199): specimens obtained in the Lake District, 1892; in Suffolk, 1894 (A. H. Macpherson); and in Essex, 1918 (J. B. Nichols).

The Portland bird was in fresh winter-plumage, looking and behaving like a wild bird, and there seems no reason to doubt that it was a natural hybrid, presumably a male, more probably between Tree (♂) and House Sparrow (♀) than the reverse. It may be added that Tree Sparrows are uncommon in Dorset, even in winter, and that there have been no definite breeding records. Possibly a stray migrant, such as occasionally occurs on Portland, may have remained to pair with a House Sparrow locally. K. B. ROOKE

**Hybrid Tree × House Sparrow in Norfolk.**—On the afternoon of 19th April 1956 an odd-looking sparrow was captured with two Tree Sparrows (*Passer montanus*) in a Heligoland trap at Cley Bird Observatory, Norfolk. In the catching-box it appeared very slightly larger than a Tree Sparrow, but closely resembled that



species in plumage-pattern, colour and restricted black throat-patch. The black ear-patches, however, were rather less distinct than normal and the crown was ashy-grey as in a male House Sparrow (*P. domesticus*). Unfortunately it was not possible to weigh the bird, but the following measurements were taken before it was ringed, photographed (see plate 15, lower) and released:— Length of bill from feathering, 11 mm.; maximum depth, 8.5 mm. Left wing, 72 mm.; right wing, 73 mm.; tarsus, 18 mm.; tail (from preen-gland to tip of longest feather), 53 mm. We have no doubt that it was a *montanus* × *domesticus* hybrid.

R. A. RICHARDSON

[We submitted Dr. Rooke's note and photographs to Mr. Richardson, and vice versa. Dr. Rooke commented that in three respects the Norfolk bird seemed to be closer to a male House Sparrow than the Portland one did: (1) the bill-shape, (2) the "ashy-grey" crown, and (3) the prominence of the single wing-bar on the median coverts. (One might speculate with the possibility that this was due to its being a hybrid between a male *domesticus* and a female *montanus*, and the Portland bird the reverse.) Mr. Richardson agreed with these points and added that in all other respects the two birds seemed to have been very similar, allowing for the abrasion that would have taken place in the one case during the winter. He also emphasized, in his additional remarks, that the general plumage-pattern and colour of the Cley bird was very close indeed to that of a Tree Sparrow: the under-parts lacked any grey suffusion and were dull buffish-white, deepest on the flanks. Finally, he suggested that the Portland sparrow was a first-winter bird basing this conclusion on its remains of a gape-flange and the sharpness of its claws when compared with the blunt ones of the adult(?) Cley bird.—EDS.]

## REVIEW

STUDIES ON GREAT CRESTED GREBES. By K. E. L. SIMMONS. Reprinted (1956) from *Avicultural Magazine*, vol. 61, pp. 3-13, 93-102, 131-146, 181-201, 235-253, 294-316. Obtainable from A. A. Prestwich, 61 Chase Road, London, N.14. Price 5s.

MR. SIMMONS's paper is really a miniature monograph. It provides a valuable summary of our knowledge concerning the reproductive behaviour of the Great Crested Grebe, including a number of new observations of his own. He also gives an interpretation of grebe courtship in modern terms, which was quite outside the scope of earlier observers such as Selous and myself.

In line with ethologists such as Lorenz and Tinbergen, he interprets the elaborate displays of grebe courtship as, in the

main, evolutionary ritualizations of the behaviour resulting from the interplay of sexual attraction, hostility (aggressiveness) and escape (fear). For this general view, he has made out a strong case.

Let us take the "Discovery-Ceremony" as an example. This is a ceremony in which the two members of a pair play reciprocal rôles. One dives towards the other, emerging usually beyond it in the curious "Ghostly-Penguin" vertical attitude. The second bird at once adopts the very striking "Cat Attitude", with ruff fully spread, and head retracted between the wings, which are outspread to show their striking white markings: it then turns so as to front the first bird as it emerges. The ceremony is usually ended by the pair indulging in a mutual "Head-shaking Display".

The "ghost-dive" of the first bird is readily interpretable as a symbolized or stylized version of the underwater attack normally practised against intruders; while the behaviour of the second bird seems definitely to be derived from an ineipient effort at escape, ending in a defensive pose (the "Cat Attitude"). Such an interpretation is in line with much modern work, which stresses the fact that in the relations between members of a pair, sexual attraction is always blended with hostility (which in its turn can involve the positive component of attack and the negative component of defence or escape).

Behaviour such as is seen in the "Discovery-Ceremony" originates as a result of the interplay of these various emotional drives. But, as Lorenz and Tinbergen have so clearly shown in other forms, selection then steps in and rapidly "fixes" the behaviour genetically, often exaggerating certain aspects of it, or adding prominent structures or patterns, so that it can serve as a sign-stimulus in its own right. Presumably the conflicting emotions and drives are then subsumed in a new synthesis, blended into a single though complex emotional state, doubtless with an agreeable dynamic of its own in place of the disagreeable dynamic involved in the original conflict.

Ritualization and conversion into an effective sign-stimulus may also occur with behaviour involving only a single drive and emotional component. Thus the "Forward Display" attitude, normally adopted towards rivals or intruders of the same sex, is clearly based on an intention-movement involving hostility and potential attack.

Among the most remarkable achievements of modern ethology is the discovery and explanation of so-called displacement activities. These are activities apparently unrelated to the needs of the moment, which are initiated in situations when a drive is frustrated. The "specific nervous energy" of the drive is prevented from issuing through its normal channels, and is "displaced" into another type of activity. Such displacement activities too can be ritualized and converted into functional sign-stimuli. In the Great Crested Grebe, displacement appears to be involved

in the commonest and most persistent form of display, mutual head-shaking. This seems definitely to be derived from a ritualization of preening actions, a conclusion strengthened by its frequent degeneration when at low intensity into ritualized "habit-preening".

Simmons's attempt to correlate this display directly with hostility reactions appears to be misguided. I would suggest that the relation is more likely to be indirect—namely, that it is a displacement activity (highly ritualized displacement-preening) called forth by the emotional conflict resulting from the co-existence of attraction and hostility in both members of the pair.

In general, however, I agree with Simmons's formulations. The inevitable hostility between members of a pair, especially soon after mating-up, tends to produce impulses of alternate attack and escape. "Courtship both inhibits these 'pair-disrupting' impulses and at the same time absorbs them". Simmons further appears to accept my suggestion, made over 40 years ago, that the resultant mutual and reciprocal displays serve as a bond between the members of the pair, though he rightly does not assign a primary originating effect to this bonding function.

His observations that the various displays follow a regular cycle, and that they all, except the head-shaking, diminish markedly after nest-building and copulation have begun, are important. He has also adduced new facts about the strange "rearing display" used in inviting copulation.

One inconsistency may be noted. On p. 144 he states that he has seen only females adopting the "Cat-display" attitude; but on pp. 192-193 he twice records a male doing so. By the way, his use of the term "Display-Ceremony" solely for the ceremony including the short dive and the subsequent cat-attitude (see above) is surely unfortunate: all courtship ceremonies involve display of some sort.

Simmons's observations bring out very strongly what struck me in 1914—namely, the great individual variation shown by different birds in regard to display (a phenomenon even more marked in other birds such as Swans).

He concludes with a brief summary of our knowledge—and ignorance!—about display in other species of grebes, a plea for comparative study of courtship and reproductive behaviour in the whole family. This could assuredly be as fruitful as the comparative studies already undertaken in ducks, for instance. Two points may be mentioned—first, that the primitive Pied-billed Grebe practices forced copulation in the water; secondly, that the display of the Western Grebe shows certain similarities to that of the divers.

The value of Simmons's paper is enhanced by the numerous excellent sketches of different attitudes and displays by Robert Gillmor.

JULIAN HUXLEY



## LETTERS

### ICELAND REDWINGS WINTERING

SIRS,—October 1956 saw an unparalleled “invasion” of Iceland Redwings (*Turdus musicus coburni*) through Fair Isle, big movements occurring on the 12th, 18th-20th and 24th-25th with westerly weather. Of 333 Redwings trapped and ringed at the Bird Observatory, over 200 were of the Iceland race.

Since it is reasonable to suppose that the bulk of these birds are spending the winter in Britain, the present season may afford a better opportunity for plotting the actual wintering distribution of this race than will arise for many years. Should there be a cold spell or spells with consequent Redwing mortality, observers will do well to examine carefully any specimens they may find. Whilst I should be glad to examine any specimens thought to be *coburni*, much the best plan is for the finder to send them to the local museum and have them prepared as skins.

The Iceland Redwing is somewhat larger and darker than the typical race of Scandinavia, and easily distinguishable “in series”; but after a long experience of handling and watching both races I do not feel that field-identification is desirable. As a general guide, any specimen which shows the following features has a reasonable chance of being *coburni*:

- (a) a strong olive wash on sides of breast and flanks;
- (b) diffused or “clouded” spotting on upper breast;
- (c) strong buffish suffusion over the lighter parts of head and breast;
- (d) under tail-coverts with large olive-brown centres and a pronounced buffish wash;
- (e) legs horn-brown rather than flesh-brown or flesh-pink.

Longer wing and tail measurements than *musicus* should be regarded as a secondary consideration—there is a large overlap between the two races, and Icelanders may have the wing as short as 116 mm. (minimum chord) or as long as 133 mm.

KENNETH WILLIAMSON

Fair Isle Bird Observatory Trust,  
17 India Street,  
Edinburgh, 3.

### INFORMATION WANTED ON BLACK WOODPECKERS

SIRS,—Can any reader give me further information about two alleged occurrences of the Black Woodpecker (*Dryocopus martius*) mentioned in an article by C. R. Haines in *The Field* in 1936?—*viz.* one seen in the Forest of Dean by T. Gee in the 1890's and one by Capt. C. Ley in the New Forest in 1913. R. S. R. FITTER

Drifts,  
Chinnor Hill,  
Oxford.

## NOTICE TO CONTRIBUTORS

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## CONTENTS OF VOLUME L, NUMBER 3, MARCH 1957

---

	PAGE
The breeding of the Storm Petrel. By Peter Davis ... ..	85
Photographic studies of some less familiar birds. LXXIX—Ptarmigan. Photographed by D. G. Andrew, H. Auger, R. P. Bille, L. Portenko, J. H. Sears, F. O. Swanberg and A. Tewnion (plates 17-24). Text by Dr. Ian D. Pennie ... ..	102
The pattern of migration in 1955 at the East Coast Bird Observatories. By R. K. Cornwallis ... ..	105
Notes:—	
Ortolan Bunting in Middlesex (Eric Simms) ... ..	118
Little Bittern in Lancashire (D. J. McCullagh, N. Harwood and M. Jones) ... ..	119
Green-winged Teal in Hampshire (E. G. Richards, Dr. C. Suffern and R. H. Dennis) ... ..	119
Wood Sandpiper in Ross-shire (John Shaw-Mackenzie and Rev. John Lees) ... ..	120
Pratincole in Devon (T. G. Coward) ... ..	120
Black Terns in Ross-shire (John Shaw-Mackenzie and Rev. John Lees)	120
Whiskered Tern in Radnorshire (G. C. Lambourne) ... ..	121
Terns nesting underground (P. E. S. Whalley and M. J. Wotton) ...	121
Regular drumming of Great Spotted Woodpecker in September (Edwin Cohen) ... ..	122
Some internal parasites from an Iceland Redwing (R. E. Scott) ...	122
Blackbird feeding brood of Dunnocks (Mrs. Ruth E. Lovell) ... ..	123
Robin's nest of unusual construction (F. L. Hudson) ... ..	124
Melodious Warbler in Devon (M. J. McVail and F. R. Smith) ... ..	124
Abnormal song of Chiffchaff (R. S. R. Fitter) ... ..	124
Brown Flycatcher in Northumberland (James Alder) ... ..	125
Review:—	
<i>The Waterfowl of the World.</i> By Jean Delacour. Illustrated by Peter Scott. Vol. II ... ..	126
Letters:—	
The Birds of Gloucestershire (The Hon. Guy Charteris) ... ..	127
Assistance wanted for Hungarian ornithologists (Guy Mountfort) ...	128
Notice:—	
Bird Observatories: new appointments ... ..	128

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Cover photograph by Stuart Smith: Female Kentish Plover  
(*Charadrius alexandrinus*) on nest

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## BRITISH BIRDS

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### THE BREEDING OF THE STORM PETREL

By PETER DAVIS

(*Field Studies Council*)

#### INTRODUCTION

THE Storm Petrel (*Hydrobates pelagicus*) is a breeding bird of the eastern shores of the North Atlantic and the western basin of the Mediterranean. Nearly all the known colonies are on small islands, and probably more than half are in western Britain. The winter range is imperfectly known, but some elements enter the south Atlantic, and numbers have been seen well south of the Cape of Good Hope (Van Oordt and Kruijt, 1953).

This is one of the smallest of the world's sea-birds, averaging about 15 cm. (6 in.) in length, and about 28 grammes (1 oz.) in weight.

R. M. Lockley (1932) was responsible for most of the breeding information given in *The Handbook of British Birds* (vol. IV, p. 27). In a study made at Skokholm, Pembrokeshire, in 1931-32, he obtained six incubation- and six fledging-periods from a total of about twenty nests. His paper gives a general account of the bird's habits during the six months in which it comes to land.

The present paper summarizes some of the results of three seasons' work on this species in 1954-56. I have tried to fill in some of the details, and to add to Lockley's results, using nest-holes in the same stone-faced banks as those he watched twenty-five years ago. Two serious difficulties have had to be contended with: the petrel's exclusively nocturnal activity on land, and a high degree of intolerance of disturbance on the part of many individuals. Moreover, it was not until the summer of 1955 that



I learned of a reliable and simple method of sexing the birds, by cloacal examination after the egg was laid. This technique, pioneered by D. L. Serventy in Australia, was successfully employed on my birds in 1956. Fortunately, most of the 1954 and 1955 breeders returned, and were sexed, in this year.

#### METHODS OF INVESTIGATION

Thirty-three occupied burrows near the Observatory buildings at Skokholm were selected in the spring of 1954, and provided with observation-shafts leading into the nest-chamber. The same holes were used in 1955, when only twenty-four were reoccupied, and in 1956 when twenty-two were reoccupied. The number of breeding pairs was twenty in 1954, nineteen in 1955, and eighteen in 1956. All birds found in the burrows were ringed, a total of eighty "adults" in 1954, seventy-three (including thirty-eight recaptures) in 1955, and fifty-five (forty-three recaptures) in 1956.

In 1954 the burrows and their occupants were examined daily at about noon and midnight\* from 18th May until the egg was laid, or until 16th July in the case of non-breeding holes. Regular night-visits were then discontinued, and were not made in 1955 or 1956, since the disturbance involved seemed out of proportion to the information gained. Day-examination in 1955 and 1956 began before the return of the first birds in April. An additional check on activity in the pre-egg stage and at the non-breeding holes was kept by placing light lattices of braeken-stems in the entrances and the serapes.

At four burrows in 1954, automatic recorders of a type devised by Dr. John Gibb were used to give more detailed information of the time of visits by the birds throughout the breeding-season. These gave some interesting results, though the clocks which were part of the mechanism were frequently stopped by the entry of vast numbers of earwigs (*Forficula*).

In 1954 and 1955 the bird found on the new-laid egg was marked with red cellulose paint on the head and rump, and a daily check on the share of the sexes in incubation was maintained at those nests where a clear view of the sitting bird could be had. The rest were opened on most days to confirm that incubation was continuing. The lattice cheeks were continued at the entrances to several burrows during incubation. From the thirty-seventh day, the sitting bird was raised gently with a stick so that the egg could be seen. If it was seen to be chipping, visits might be made twice or three times each day until the hatch.

The chick was weighed at twenty-four hours old, then every forty-eight hours until the first interval in brooding by the parents. For the rest of the fledging-period, in 1954 and 1955, it was weighed twice daily, in the morning and evening. In 1956 only evening weighings were made, apart from a series of special mid-night and morning weighings designed to find the actual rate of

\*All times G.M.T.

loss. The beam-balance used weighed accurately to one tenth of a gramme. As a protection against the weather, it was suspended inside a wooden box. Chicks accustomed to the procedure sat quietly on the pan without any covering.

Many observations made away from the study-burrows, and also some references in the Skokholm Bird Observatory records for earlier years, have been made use of in this account.

#### ATTAINMENT OF MATURITY

The age at which a Storm Petrel may breed is still not accurately known. *The Handbook* (vol. IV, p. 29) says that birds completing moult in May, June and July are probably a year old, and Mayaud (1950) found that one such bird had undeveloped breeding-organs. It is not known if the birds return to the colony in their first summer. Roberts (1940) concluded that some Wilson's Petrels (*Oceanites oceanicus*) spend a non-breeding year at sea, but his evidence was not positive. Some of the larger petrels spend several years away from the colony; Manx Shearwaters (*Procellaria puffinus*) do not normally return until they are three years old, and may not breed until they are five or older. Gross (1947) reports the recovery at a colony of five Leach's Petrels (*Oceanodroma leucorhoa*) ringed as nestlings. Two were one year old, but were not known to be breeding; a three-year-old bird was breeding.

The ringing of young Storm Petrels has not so far thrown much light on this problem. Very few young were ringed at Skokholm before 1954, and only one of these has been recaptured. This bird was two years old. Twenty-seven were ringed at Skokholm in 1954, and sixty-nine in 1955, but none of these has been recaptured, though one 1955 chick was found dead at Bude, Cornwall, only seventy miles from Skokholm, in August 1956. These birds, with forty young ringed in 1956, may provide some recaptures in our trammel-nets in the future.

The limited amount of evidence obtained so far, suggests that once an immature bird has returned, it normally spends no more than one season in the colony as a pre-breeder. Thus of seven birds which occupied burrows throughout the 1954 season without breeding, and which returned to these holes in 1955, all bred in the second year. Five definite non-breeders of 1955 were recaptured in 1956; four bred, and one disappeared early in the season. I have not encountered a case of a bird spending two entire seasons in ownership of a burrow without nesting in the second; but it is possible that immatures may not adopt a regular burrow in their first season in the colony.

#### THE INEFFECTIVE BIRDS

Before embarking on the account of breeding activities, I must mention the large body of birds which have no breeding responsibilities for all or most of the season. This body consists

of the pre-breeders (immatures, perhaps nearly all of one age-group), the other non-breeders (the very small number of mature birds which do not breed), and the failed breeders (birds which have lost or deserted their egg or chick). Most of these birds possess, or quickly acquire, burrows of their own, but many pay casual visits during the season to birds in other holes.

Of the eighty "adults" ringed in my burrows in 1954, only thirty-eight (48%) were known to be breeding. In 1955 the proportion was thirty-eight out of seventy-three (52%), and in 1956 thirty-six out of fifty-five (65%). The 1955 and 1956 figures will be biased in favour of the established breeders, since no new burrows were opened in these years.

It is not possible to infer from these figures that all the remainder of the birds I caught belonged to the "ineffective" category. I have found, in a few instances, that established breeders may visit strange burrows and even spend twenty-four hours there, during the pre-egg stage. However, such behaviour seems rather uncommon, so that on the basis of the first (1954) sample, the ineffectives may number nearly half the total catch in one season, before any allowance has been made for the return of breeders failing in the study-burrows.

The failed breeders undoubtedly provide a large contingent in this army of unemployed. Birds which have lost their eggs may return for up to ten weeks afterwards, and those which have lost small chicks for up to four weeks. Many do not finally desert the island until after the middle of August, the time of departure for most non-breeders also. In the cases of desertion, one bird of the pair usually fails to return in the rest of the season, but the other continues to visit the nest.

Some idea of the proportion of failures may be gained from the results of an examination of over a hundred and twenty burrows carrying Storm Petrel scent, made in September 1955. Evidence of breeding was found in eighty-two of these holes: fifty-nine held chicks, twenty-three had cold or broken eggs. Three other eggs known earlier in the season had disappeared without trace, and some other holes may have also lost all trace of nesting. The proportion of failures was therefore in excess of 25%, in a summer quite free from adverse weather. A short series of thirty-nine nests carrying evidence of breeding was examined in the very wet and windy summer of 1956. This yielded only twenty-four live chicks, so that the minimum of 38% had failed. The study-burrows are not included in these figures: four out of nineteen failed in 1955, and nine out of eighteen in 1956.

#### THE BURROW

At Skokholm, where the community at midsummer may exceed fifteen hundred birds, a wide variety of sites is occupied. Of these, perhaps half are in natural crevices—among boulders above high-



water mark, under slabs of Old Red Sandstone broken from the cliffs and outcrops, or in fissures of the solid rock. The remainder are either in the hedge-banks of the old fields, with a few in dry-stone walls, or in burrows of rabbits (*Oryctolagus cuniculus*), shearwaters, and Puffins (*Fratercula arctica*) in more open country. Exceptionally, nests have been found in woodpiles, under wooden huts, and the like.

At the more complex holes several pairs of breeding petrels may share the same entrance, but the nests are usually in different branches of the system. In rabbit, shearwater or Puffin holes, where these are still in use by the original owners, the Storm Petrels excavate a small side-tunnel, or use one which has partially collapsed and can no longer be entered by the larger animals. The entrance to my Burrow No. 22 was shared in 1954 by a pair of shearwaters and several rabbits. The hazards faced by the small petrels in such burrows are considerable. Battered corpses were found in 1955 in both shearwater and Puffin holes. There have also been cases of Puffin (Burrow 10, 1954) and shearwater (Burrow 11a, 1955) entering and destroying nests in my study-burrows. For the most part, however, the entrances are too small to allow the entry of the larger birds. Some of my burrows have entrances barely two inches in diameter.

Many of the burrows must obviously, from their small size, have been excavated by the birds themselves, and birds with earth-encrusted bills and feet have been found on several occasions. Burrow 26 was a mere hollow, where a stone had fallen from a wall, when I first found a bird present on the night of 7th June 1954. Two nights later two birds were there, both engaged in digging. Their actions continued for a few seconds after the beam of my torch shone upon them—a downward scraping motion with the bill, the loosened earth thrown backward with the feet. The hole was a foot deeper on the following day.

The nest-scape, at burrows I have examined, has been from four inches to eight feet (average about  $2\frac{1}{2}$  feet) from the entrance, and may be considerably further in some cases. The birds apparently prefer to have a low ceiling over the nest, and often, where my observation shaft appeared directly over the original scrape, they have made a new scrape in a niche at the side of the tunnel, though every effort is made to ensure that the cover is lightproof. Most nests are in complete darkness, but I have found a few so exposed that the sun may shine on to the sitting bird for part of each day.

The nest itself is usually just a shallow depression about three inches in diameter in dry earth or fragments of stone. A few short pieces of bracken and other dry vegetation are very occasionally present, and the stems I used as lattices were often incorporated. Many nests acquire contour-feathers from the sitting birds in late July and August, when a body-moult is taking place. I have never proved that the birds deliberately carry material to the nest, but

David Wilson has shown me a photograph of a very substantial nest, taken at Roaninish, Donegal. This had almost certainly been built by the birds. A. Gordon (1920) found that a rough nest was often made in shallow holes where material was at hand. Roberts (*loc. cit.*) has shown that Wilson's Petrel will construct a substantial nest, and Ainslie and Atkinson (1937) showed the same for Leach's Petrel.

#### OWNERSHIP OF THE BURROW

In the Skokholm files there are several pre-war records of Storm Petrels returning to the same burrow in successive seasons, but no long-term study of this propensity has been made.

Recaptures of breeders in my burrows serve to demonstrate the attachment of individual birds to particular holes. Thirty-seven 1954 breeders were potentially available for recapture in 1955, if none died in the winter. Sixteen had bred successfully, and fourteen of these returned in 1955, all to the same holes. Twenty-one had failed in 1954; twelve of these returned, ten to the same holes. There were again thirty-seven breeders of 1955 potentially available in 1956. Twenty-nine had been successful, and of these twenty-eight returned in 1956, all to the same holes (the twenty-ninth may have returned, but its burrow was visited only for a few nights in 1956, and it was not caught). Eight birds were failed breeders in 1955, and six of these came back, to the same burrows, in 1956. To summarize, forty-two out of forty-five successful breeders, and eighteen out of twenty-nine failed breeders, were recaptured in the following year, and only two, both failed birds, had changed their burrows.

Most of the failed breeders which did not return in the subsequent year were individuals which had deserted their egg, and never came back to the original burrow, even in the same season.

The forty-two ineffective birds of 1954 provided only eleven recaptures in 1955, seven of which were in the same burrows; and of the thirty-five ineffectives of 1955, only nine were recaptured in 1956, all in the same holes. Twelve of these twenty recaptures had been regular occupants of eggless burrows in the previous year; ten of these were in their original holes.

These figures suggest a very strong sense of ownership on the part of successful breeders. Probably the factor of human disturbance is reflected in the lower level of returns in the failed breeders. Unfortunately my records do not allow me to divide the ineffectives into clear-cut groups of non-breeders and failed breeders, but there seems to be a fairly strong attachment in the non-breeders which have settled down to regular occupation of one hole, and little or no attraction to one hole on the part of wandering failed breeders and casuals.

Mutual ownership of a burrow, coupled with an early return by established breeders (discussed later), would tend to bring the same

birds together as mates in successive years. The burrow is likely to be the prime bond between the pair, for the difficulties of maintaining contact away from its vicinity would seem too considerable to be overcome. Pairs known to me have been permanently dissolved when one bird has forsaken the burrow in the pre-egg stage; such birds have bred elsewhere with new mates. The "pull" of the burrow is not always broken when one bird deserts in the egg stage, for several deserters have turned up again in the original holes in the next year. There was an interesting case in 1954 of both birds of an established pair deserting their burrow in the pre-egg stage, both being found subsequently in new burrows with new mates.

On one occasion in May 1955 I found two birds together in Burrow 12, which had been mates in Burrow 2 in 1954. They were reunited only on one day, and this could have been merely a chance encounter, for the new burrow was very near the old.

### **'The Pre-egg Stage**

#### ARRIVAL

In most years the first Storm Petrels return to Skokholm in the last week of April. To judge from the 1955 and 1956 figures, which the Observatory records for earlier years seem to support, numbers are fairly low until the middle of May, the bulk of the population returning in the second half of that month. Most of the birds I have found to be non-breeders arrived towards the end of May and in early June. The number of strange visitors to the burrows also increased sharply about this time. The population then remains at its highest level until late July or early August; it is only during this period that trammel-netting for ringing purposes is really profitable.

The earliest arrivals appear to be experienced breeders. Twelve birds were caught by day before 15th May 1955, and all these had bred in 1954. All the fifteen burrows visited by that date were breeding burrows in the previous year. In 1956 thirty-one birds were caught by day before 15th May, twenty-four of which were known to have bred in 1955. No bird known to be a non-breeder in one year has been caught earlier than 15th May in the next, its first breeding-season.

#### THE DURATION OF THE PRE-EGG STAGE

The figures given in Table I are derived only from nests where the pre-egg stage was not lengthened or complicated, to my knowledge, by visits from strange birds.



TABLE I—DURATION OF PRE-EGG STAGE OF THE STORM PETREL  
(*Hydrobates pelagicus*)

Burrow No.	Year	1st visit (evening)	Egg laid (early)	Duration of stage (days)	Status of pair comp'd. previous year
8	1954	23 May	1 July	38	—
1	1955	7 May	19 June	42	Same
4		8 May	16 June	39	Same
5		24 April	4 July	71	♂ same, ♀ new
6		27 April	26 June	60	♂ same, ♀ prob. same
8		29 May	29 June	31	Same
9		27 April	12 June	46	Same
11A		3 May	15 June	43	Same
12B		28 April	20 June	53	♀ same, ♂ prob. same
14		28 April	18 June	51	♂ same, ♀ prob. same
19		23 May	27 June	34	Non-breeders 1954
33		9 May	23 June	45	Same
2	1956	3 May	2 July	58	♀ same, ♂ new
6		8 May	21 June	53	Same
11A		1 May	18 June	47	♂ same, ♀ new
11B		4 May	25 June	51	Same
12B		6 May	27 June	51	Same
14		5 May	8 June	33	Same
15		7 May	25 June	48	Same
17A		3 May	25 June	52	Same
17B		6 May	11 June	37	Same
19		6 May	20 June	44	Same
20		30 April	28 June	58	Same
24		30 April	15 June	45	Same
28		16 May	24 June	39	Same
33		8 May	25 June	47	Same

Average duration of the pre-egg stage:  $46.8 \pm 9.1$  days.

In general I have no means of accounting for the considerable variation in the length of the pre-egg stage, but probably much depends on the physiological condition of the individual birds. It is, however, possible to hazard an explanation for some of the longer periods. It will be noticed that the longest period (71 days) was at a nest where an established breeder had to find a new mate. In this instance over a month passed before he succeeded in doing so. There were also three other nests, which I have not included in the table, where the unusually long pre-egg stage can be accounted for. These were Burrows 2 and 24 in 1955, and Burrow 9 in 1956, which had pre-egg stages of 68, 65 and 67 days respectively. In all these nests one bird of the established pair deserted in June, and the remaining birds had to find new mates. They quickly did so, but about thirty days then elapsed before the eggs were laid, on 30th July, 16th July, and 7th July. Such rematings must be responsible for some of the very late eggs and chicks recorded from time to time in Storm Petrel colonies.

#### FREQUENCY OF VISITS

Lockley found that in the pre-egg stage his birds spent "roughly

one day in every three at the nest", and added "my observations tend to prove that they do not necessarily return on the next evening, and that, if they do, they may not stay over the following day. More often, they do not appear to visit the nest for perhaps two or three nights". In writing this he was striving after a generalization, and I can appreciate his difficulties, for the frequency of night-visits and of day-occupation varies greatly, and no two of my nests have had an exactly similar pattern.

In Table II, I have summarized the records of day-occupation at twenty-eight nests where the pair remained intact in the pre-egg period. It ignores any day-occupation of these nests by strangers.

TABLE II—DAY-OCCUPATION IN THE PRE-EGG PERIOD OF THE STORM PETREL  
(*Hydrobates pelagicus*)

Burrow No.	Year	♂ alone	Both birds	♀ alone	Total days occupation	Duration of pre-egg period (days)
4	1955	0	1	0	1	39
6		2	6	0	8	60
8		0	3	0	3	31
9		2	3	1	6	46
11A		0	2	0	2	43
11B		2	2	0	4	>27
12B		1	5	0	6	53
14		1	4	3	8	51
17A		1	2	1	4	>39
17B		2	1	0	3	>23
19		6	3	1	10	34
20		0	4	1	5	>34
28		5	5	0	10	>27
33		6	3	1	10	45
2	1956	0	4	2	6	58
6		3	4	0	7	53
11B		0	5	1	6	51
12B		0	6	0	6	51
14		1	2	1	4	33
15		0	4	2	6	48
17A		1	4	1	6	52
17B		0	3	2	5	37
17C		0	2	3	5	>52
19		4	5	1	10	44
20		0	4	2	6	58
24		1	3	1	5	45
28		8	4	2	14	39
33		5	5	1	11	47
Totals		51	99	27	177	

It will be seen that the number of occasions when the birds remained in the nest by day bears no close relationship to the length of the pre-egg stage. One interesting fact that emerges is the tendency for males to remain by day more often than females. L. E. Richdale (personal communication) suggested that this might be due to a stronger and more protracted urge to mate, and hence a greater attachment to the mating chamber, on the part of the male. This state of affairs is common to a wide variety of animals.

Day-occupation had a haphazard distribution throughout the

pre-egg stage, except in the last week when it was uncommon to find a bird in the nest by day. There have been only eleven instances of day-occupation in the week before laying, at fifty nests observed, and only three cases of occupation on the day before laying (in two of these three the occupant was known to be male). The full explanation of this almost complete cessation of day-occupation remains to be found, but it makes available the maximum amount of feeding-time just before the long spells of the incubation begin. It may suggest that the time of actual mating has passed.

Intervals between the days of occupation have varied greatly in length, but a few nests have shown some regularity over short periods, usually with a three-day cycle. Birds have occasionally remained in the nest for two successive days; of twenty-six instances recorded, such birds have been accompanied by their mates on the first day three times, on the second day nineteen times, and on both days twice. In one other case a "visitor" was present on the second day, and only once was the bird alone on both days. In addition, there has been one case of a bird remaining for three days, accompanied by its mate on the second and third. Apparently the usual incentive for a prolonged stay is the arrival of a fresh bird on the second night.

Night-visits, lasting only three or four hours at most, are very much more frequent than day-occupation. The twenty-eight burrows listed in Table II had 439 night-visits quite apart from the 177 occasions when birds remained during the day. Again there is no constant interval between visits; my burrows have been visited for up to twenty-three successive nights, though visiting for more than about ten successive nights is rare. There have also been gaps of up to seven nights between visits; the longer gaps were all early in the pre-egg period.

It is possible that some of the night-visits recorded were made by "visitors" alone, but I believe that it is unusual for strangers to enter unless one of the owners is present, and calling. I have no reliable figures to show how often the visits of the pair coincide, but my 1954 experience of night-visits suggested that the birds are together on more than half of the nights when visits are made.

Many of my nest-records suggest a tendency for visits to become more frequent as the pre-egg period progresses. In an attempt to express this, I reduced the visits at twenty "uncomplicated" nests to "visit-units", in which each unit represents one night of activity at the nest, day-occupation counting two units, and two successive days of occupation counting three units. The average attendance figures at these twenty nests were: first week of the period 4.1 units, second week 4.2; third week before laying 4.6, second week before laying 4.7, last week before laying 5.2; and attendances in any intervening weeks average about the 4.5 level.

#### SONG AND COURTSHIP

The song of the Storm Petrel is described in *The Handbook* as



“a not loud but penetrating sound consisting of a harsh, uneven purring ‘urr-r-r-r-r’ long sustained . . . ending abruptly with ‘chikka’, almost a hiccough”. I have no quarrel with this description, though Charles Oldham’s statement that the hiccough sounded “like a fairy being sick” evokes for me something much nearer the actual noise. I have not attempted to beat Oldham’s record of an unbroken run of churring with 983 “chikkas”, though I have no doubt that this could be done, for the sound will issue from the burrow for literally hours at a stretch. I have rarely heard a complete burst of song from a bird on the wing, and I doubt if one could prove *The Handbook* assertion that it is used, even “exceptionally”, “as call by flying bird to sitting mate”.

The song may be heard at any time from late April to early September, but the peak is in late May and June, before the eggs are laid. Incubating birds do not sing much, and there is no song after the chicks hatch, so that birds singing in late summer are almost all ineffectives. I believe that the most sustained singers are birds alone in the nest, and I seldom heard song from a burrow which proved to have two birds, when I was making night-examinations in 1954. It is not uncommon to hear a bird singing during the day, particularly in the afternoon and early evening, and this often seems to be a response to noise or movement outside the burrow.

The song appears to serve a dual function of announcing ownership and attracting the notice of other birds. This attraction seems a powerful one, and strange birds, even established breeders from other nests, may often be found at the entrance of a burrow where a bird is singing, if one visits a colony after dark.

The burrow is apparently not defended against intruders in the pre-egg stage, but I have never found a stranger in the scrape after the egg was laid, and only rarely when two birds were already present in an eggless hole. The less sustained nature of the singing, or its complete absence, in such circumstances, may account for this. It is possible that Storm Petrels behave promiscuously at times, though I have no proof of it. Fidelity to one mate could be explained by the fact that intruders rarely return twice to the same hole, whereas the pair meet frequently in their burrow.

In late May, June and early July there takes place a “display-flight” which can often be watched by moonlight or twilight. (Storm Petrels are not at all inhibited by moonlight, rather the reverse; and the earliest birds arrive while there is still some daylight, about ninety minutes after sunset, the latest leaving less than an hour before sunrise). This flight may take place at any hour of the night, and occurs in a fairly limited area above the burrow, where it probably begins and usually ends. One bird closely pursues the other, often within six inches of its tail, and the flight is more rapid and direct than the normal fluttering, erratic action. The course followed is often roughly circular, more

often extremely irregular. At times the birds part, together forming a figure of eight, and resume the chase when they meet again in the centre. A loud call which I write as "terr-chick" is given at intervals, and becomes louder and more frequent as the excitement mounts, particularly if a third bird joins in, as sometimes happens. Snatches of the purring song are given, and several variations of the "terr-chick" call, with the syllables transposed or the first one omitted. There is also a very rapid "wick-wick-wick" which I have heard very rarely.

Occasionally birds can be heard to collide in the air, though I have never actually seen this happen. Williamson (1948) saw collisions between Leach's Petrels in the Faeroes, and regarded them as part of the bird's behaviour pattern, a prelude to entry into the burrow. His birds fell to the ground after colliding, and apparently disappeared into holes.

Roberts has suggested that the white rump (of Wilson's Petrel) may act as a releaser of the aerial chases. Certainly it is designed to elicit a visual response of some kind, and there are many analogies with other birds and mammals, in which white rump-markings displayed by a retreating animal bring pursuit reactions into play.

#### COPULATION

I have not distinguished any sound from the burrow which might be particularly associated with copulation, though light scuffings and squeakings may be heard when two birds are in occupation. Ainslie and Atkinson (*loc. cit.*) heard a distinctive sound from Leach's Petrels, which they suggested was uttered only during the act of mating, and apparently only once in a season.

It is not impossible that copulation may sometimes occur outside the hole. At Skokholm on 10th June 1955 Geoffrey Stansfield saw two birds hovering close to the ground, one directly above the other. They remained almost motionless for several seconds in the beam of his torch, before flying off into the darkness. It seems not unlikely that he had interrupted an attempted mating.

#### The Egg Stage

There is no record of a Storm Petrel laying a clutch of more than one egg at Skokholm; indeed, I have not so far traced any well-authenticated record of a clutch of two, though most reference-books imply that this may occur. The egg is pure white, often with a few red-brown speckles at the large end, and weighs about 5 grammes (not .387 as stated in *The Handbook*—a figure which, however, applies to the blown shell alone).

The period of time during which the eggs are laid is protracted. The earliest egg-date for Skokholm is 28th May (several years), and the latest about 20th August (a chick which hatched about 28th September 1956). Most of the eggs are produced in the second half of June and the first few days of July. The graph

in Fig. 1 is derived from the data for fifty-seven eggs laid in my burrows in 1954-56, and shows the percentage of eggs laid by the end of each five-day period through the laying-season.

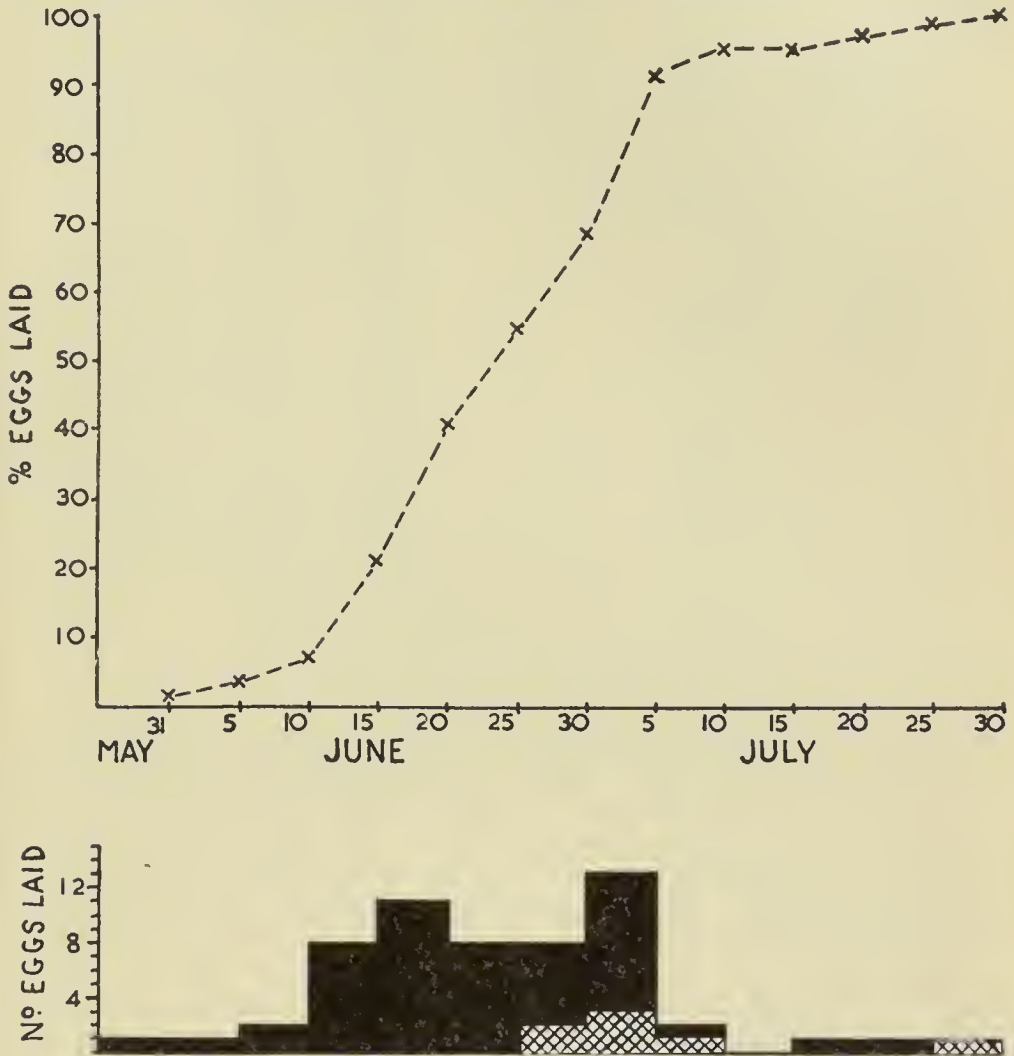


FIG. 1.—THE EGG-LAYING SEASON OF THE STORM PETREL (*Hydrobates pelagicus*) The graph at the top (Fig. 1a) shows the percentage of the season's total of eggs laid by the end of each five-day period, while the histogram below it (Fig. 1b) shows the actual number of eggs laid in each period.

The histogram (Fig. 1b) is derived from the same data, but shows the actual number of eggs laid in each five-day period. The double peak is present when the three years are plotted independently, but is obscured slightly in Fig. 1b, because the 1956 peaks were a day or two later than those of 1954 and 1955. My nest-records for 1955 and 1956 indicate that the bulk of layings in the first peak were by experienced breeders, whilst many of those in the second peak were by newly-formed pairs, or birds which had not previously bred. The cross-hatched sections of the histogram represent eggs which were laid by pairs including at least one non-breeder of the previous year.



Three of the very late eggs have already been referred to in the discussion of the pre-egg stage, and explained by the prolongation of that stage due to rematings. Another (22nd July 1954) was a replacement laid twenty days after the loss of the first egg in Burrow 15a. The laying of replacements is evidently rare in the petrels, though Gross (1935) records one instance in Leach's Petrel, and there is another record for the present species (S. Gordon, 1931). Very late (November) chicks have been found by several writers, and late layings are not rare, but the proportions due to remating and to replacement cannot yet be assessed.

In 1954 and 1955 I found that all the eggs had been laid between midnight and noon, and knew that in four nests they must have been laid during the hours of darkness, for these were left unincubated on the first day. It was not until the cloacal examinations of 1956 that I discovered that the male usually (33 out of 39 records) takes the first incubation shift, which means that the female must return, lay the egg, and depart, all within the space of four hours or less. This seems to imply that she has some physical control over the actual time of laying. She may not always succeed in reaching the burrow, for on several occasions in the 1954-56 seasons I have noticed fresh eggs in open sites to which they could not have rolled or been pushed by the bird. There were usually suitable holes near-by.

#### THE INCUBATION PERIOD

Table III condenses information about thirty-six nests where the eggs were successfully hatched. The incubation period is given, to the nearest twelve hours. The days on which the egg was not incubated are listed, where known, in the last column; the words "probably continuous" mean that the nest was not examined on all days, but that I have no reason to think there was any interruption in the incubation.

TABLE III—INCUBATION PERIODS OF THE STORM PETREL (*Hydrobates pelagicus*)

Burrow No.	Year	Egg laid	Egg hatched	Incubation period (days)	Remarks on incubation
1	1954	14 June	24 July	40	—————
1	1955	19 June	28 July	39	Probably continuous
4	1954	18 June	29 July	41	Not incub. 1st day
5	1954	1 July	11 Aug.	41	—————
5	1955	4 July	13 Aug.	40	Probably continuous
6	1955	26 June	5 Aug.	40	—————
6	1956	21 June	31 July	40	Probably continuous
8	1955	29 June	7 Aug.	39	Probably continuous
9	1954	9 June	21 July	42	Not incub. 3rd, 29th, 40th day
9	1955	12 June	23 July	41.5	Not incub. 1st day
9	1956	7 July	17 Aug.	41	Not incub. 25th, 30th day
11A	1954	21 June	31 July	40	Continuous
11A	1956	18 June	29 July	41	Not incub. 2nd day
11B	1955	3 July	15 Aug.	38	Continuous
11B	1956	25 June	4 Aug.	40	Not incub. 37th day

Burrow No.	Year	Egg laid	Egg hatched	Incubation period (days)	Remarks on incubation
12	1954	2 July	11 Aug.	40	Probably continuous
12	1955	20 June	29 July	39	Not incub. 6th day
12B	1956	27 June	6 Aug.	40	Probably continuous
14	1954	30 May	8 July	39	Probably continuous
14	1955	18 June	27 July	39.5	Probably continuous
15	1956	25 June	6 Aug.	42	Not incub. 2nd day, ? later
16	1954	3 July	15 Aug.	43.5	Not incub. 3rd, 4th day
17A	1955	1 July	9 Aug.	39	Continuous
17A	1956	25 June	14 Aug.	50	Not incub. 7th, 33rd, 35th-39th, 43rd, 44th, 48th, 49th day
17B	1955	26 June	7 Aug.	42.5	
17B	1956	11 June	24 July	43	Not incub. 2nd, 3rd, 4th day
19	1955	27 June	7 Aug.	41.5	Not incub. 12th day
20	1955	26 June	5 Aug.	40	Probably continuous
20	1956	28 June	9 Aug.	42	Not incub. 4th, 35th day
24	1955	16 July	24 Aug.	39	
24	1956	15 June	26 July	41	Not incub. 6th day
28	1954	4 July	13 Aug.	40	Continuous
28	1955	20 June	29 July	40	Continuous
28	1956	24 June	2 Aug.	39	Probably continuous
33	1955	23 June	1 Aug.	39	Continuous
33	1956	25 June	4 Aug.	40	Probably continuous

Average incubation period:  $40.6 \pm 2$  days.

Lockley's six incubation-periods ranged from 38 to 40 days, with an average of 39.5. He considered that 38 days was "probably nearest the true period" since a nest with this incubation-period had had less disturbance than the other five. Two of his forty-day hatchings were of eggs which had been left unincubated on one day early in the period.

Looking through my records, it is apparent that an egg continuously incubated may take up to forty days to hatch, perhaps slightly longer, whereas another may hatch in 39 days despite one day of non-incubation. As might be expected, most of the eggs taking over 40 days to hatch are known to have undergone chilling.

Eggs in my burrows have hatched successfully after two (Burrow 16, 1954) and three (Burrow 17B, 1956) successive days of chilling early in the period, and after up to three widely separated days. Much more remarkable is the case of Burrow 17A (1956) where the egg was chilled for eleven days in all, including spells of five, two and two days late in the period, and hatched after 50 days. Matthews (1954) has discussed resistance to chilling by the embryo Manx Shearwater and its value. Well-developed eggs hatched after up to seven days chilling in the burrow, and were viable after thirteen days in the laboratory. Matthews suggests that resistance to chilling would be more "useful" to the smaller petrels, particularly in times of erratic food-supply, since they cannot undertake the lengthy incubation-shifts of which the shearwater is capable.

The immediate cause of gaps in the incubation is the failure of

the off-duty bird to return when the sitting bird is ready to depart, and this may not always be related to problems of food-supply. Non-incubation on the first day, which has occurred at four of my fifty-seven nests, is a special case, for here it cannot be hunger that compels the female to leave again on the same night that she has returned to lay the egg, and the likelihood of the male's returning on that night can be no greater than it was in the week preceding laying. At the burrow with exceptionally long chilling-periods, one of the pair was lost in a big gale at the end of July 1956, and never returned; the other bird hatched the egg alone. Several birds from other eggs were prevented from returning at the right time by this same gale, with the result that there were gaps of one or two days in the incubation. Some other gaps, and particularly on the second day after laying, are likely to have been caused by my interference.

#### SHARE OF THE SEXES IN INCUBATION

Table IV shows the share taken by each bird in the hatching of eight successful eggs, and the number and length of the individual shifts.

TABLE IV—SHARE OF THE STORM PETREL (*Hydrobates pelagicus*) SEXES IN INCUBATION

Burrow No.	Days incub.		No. of shifts				
	♂	♀	1	2	3	4	5 days
9 (1954)	18	21	2	5	9		
9 (1955)	18	23	1	4	8	2	
11 (1954)	20	20	2	4	7	1	1
17A (1955)	17	22	2	6	7	1	
19 (1955)	22	19	4	9	5	1	
28 (1954)	19	21	1	3	8	1	1
28 (1955)	24	16	3	5	5	3	
33 (1955)	20	19	2	8	7		
Totals	158	161	17	44	56	9	2

A larger sample than that given in the table would certainly be desirable, but it seems very probable that the sexes take an equal share of the work. Three-day shifts were the most common, and some nests had a fairly strict three-day cycle of change-overs for a part of the incubation-period.

An interesting feature at all these nests was a change-over during the time the egg was chipping, even though at several nests the previous shift had only lasted for one day.

#### NIGHT ACTIVITY AT THE NEST

In 1954 the lattices and recorders maintained at the entrances of several nests showed that the nests were being visited, during incubation, far more frequently than change-overs were taking



place, and more attention was paid to this activity in 1955. Whereas change-overs occurred on 38% of the nights available (35-44%, eight nests), visits were made on 70% of the nights (63-83%, five nests), or almost twice as frequently.

I think that these visitors would usually be the unoccupied birds of the pairs; change-overs at irregular intervals, and the rarity of non-incubation spells of more than 24 hours, support this view. I have already suggested that incubating birds do not sing much, and that silent burrows are unattractive to outsiders. (There was nothing to make me suspect that the incubating birds were leaving for short outings—the lattices were pushed inwards.)

It would have been interesting to have had a series of weights of incubating birds, to find how much weight the birds lose during the shifts, and whether they are ever fed by their mates; but after bitter experience in 1954 I have had to avoid this extra disturbance. I did, however, obtain two short series of weights from a particularly stolid pair. The female was weighed during a two-day shift, and fell steadily from 32 to 29.5 grammes in the 48 hours; and in a three-day shift the male fell from 33.5 to 29.

#### INFERTILE EGGS

There have been four eggs in the study burrows which have been incubated continuously, or with only a one-day gap, for longer than the normal incubation-period, but failed to hatch. One of these was incubated until the 55th day, and again on the 58th and 62nd days; another for 52 days and then broken; another for 50 days, and the fourth for 46 days. None of these had any sign of an embryo. Several other eggs may either have been infertile or excessively chilled, for although they were abandoned not long before the expected time of the hatch, they had no developed embryo when examined. The only one of these which was incubated for over forty days had been chilled for two periods of 48 hours, and one of 72 hours in the second half of the period, and probably this had killed the embryo.

#### THE HATCH

Chipping of the egg became visible from 72 to 24 hours before the chick emerged, and a low peeping note might be given by the chick from the time a small hole was made. Incubating birds at this time showed more marked signs of anxiety, when disturbed, than at any other time in the incubation-period, and would peck fiercely at the slim stick with which I raised them to see the egg.

*(To be concluded)*

# PHOTOGRAPHIC STUDIES OF SOME LESS FAMILIAR BIRDS

## LXXIX. PTARMIGAN

Photographed by D. G. ANDREW, H. AUGER, R. P. BILLE,  
L. PORTENKO, J. H. SEARS, P. O. SWANBERG and A. TEWNION

(Plates 17-24)

THE Ptarmigan (*Lagopus mutus*) is widely distributed throughout the Palaearctic and Nearctic regions. For many years the record of being "the northernmost bird ever collected by man" was held by a Ptarmigan which was shot in 1876 at 82° 46' N. in Grant Land at the extreme north of Ellesmere Island (Salomonsen, 1950): and the same author cites a record of footprints having been seen in May 1882 on Lockwood Island, Greenland, at 83° 24'. In the Palaearctic they have been recorded at 80° 20' in North East Land (Koenig, 1911), but surely the most northerly game birds ever *eaten* must have been the ingredients of the "Ptarmigan fricassee" which was cooked on Rudolf Island, Franz Josef Land, at 81° 45' by the members of the Ziegler-Fiala expedition in November 1904 (Anon., 1908).

Southwards, the range extends in the Old World to the Pyrenees at 42° 30', the Alps at 46° 50', the Altai at about 48° and finally to central Japan at about 35° N.; in the New World to Newfoundland at about 48°. Peters (1934) lists 26 subspecies, but subsequently two have been dropped and at least one added. The Japanese form *japonicus* is the smallest, with a male wing-length of 190-200 mm., the largest being the Spitsbergen form *hyperboreus* with a wing-length of 220-244 mm. (Hartert, 1922). The Canadian and south Greenland *rupestris* has a wing-length of 190-211 mm., and the north Greenland *caplus* of 211-223 (Salomonsen, 1950).

As might well be expected in a non-migratory species of such wide latitudinal distribution, there is a correlation between latitude and altitude of habitat, for whereas *helveticus* (Alps) has a summer-range of 5,100-10,500 feet, and *pyrenaicus* (Pyrenees) of not below 6,000 feet (Hartert, 1922), *hyperboreus* (Spitsbergen and Franz Josef Land) ranges from sea-level (Longstaff, 1924) as do the Greenland forms *rupestris*, *caplus* and *saturatus* (Salomonsen, 1950). Between these extremes there is a corresponding variation, for example *mutus* in south Norway is seldom found under 3,600 feet, but in east Finnmark it descends to 900 feet (Lovenskiold, 1947), and in Scotland *millaisi* almost certainly breeds below 1,500 feet in north Sutherland though generally above 2,000 feet elsewhere in the country.

Throughout the greater part of its range the species inhabits typical "Ptarmigan country"—bare stony flats and mountain-tops.

Exceptionally, however, as in south Greenland and Iceland, where the Ptarmigan is the only gallinaceous bird, it may be found even in summer in situations which would appear more appropriate for a Willow Grouse (*L. lagopus*); J. Sears' remarkable photograph (plate 17) shows a hen *islandorum* incubating in a thick cover of Dwarf Birch (*Betula nana*).

*The Handbook* plumage-description applies in general to all races: in both sexes there are three incomplete annual moults. The winter-plumage is pure white except for the rectrices and shafts of the primaries, which are black, as are the lores, and there is a black eye-streak and a black spot behind the eye. The hen has no black on the head except in *capitus* (north-west Greenland) which has a black loreal patch almost as large as that of the cock. The winter-plumage is usually present from about mid-October to mid-June, varying in different localities, and being replaced by a gradual moult which in the Scottish *millaisi* may begin to be evident as early as February by the appearance of a few dark feathers on the neck. The moult proceeds much more rapidly in the females (plate 18, upper) which soon have the appearance of having commenced to moult earlier (compare plates 19, upper and lower), the ensuing summer-plumage being most fully developed in the southern races.

The summer-plumage (plate 18, lower) is subject to great geographical variation, but all races have in common the white lower breast and belly, the white primaries—which are moulted once only, in autumn—and the black and olive-brown vermiculations of the upper-parts, coarser and browner in the female. The moult to the greyer autumn-plumage corresponds to the annual complete moult in other birds and is the most comprehensive, involving not only the body-feathers, but also the rectrices, primaries and secondaries, although many summer-feathers are not moulted until replaced by true winter-feathers. In the female, the proportion of summer-feathers retained increases towards the north until in N.E. Greenland and Spitsbergen the autumn-plumage of the hens is almost totally suppressed. The assumption of winter-plumage may be much delayed in the southern races; in Scotland coloured feathers may be retained until late in November.

The moult-sequences have been described in the most meticulous detail by Salomonsen (1939) who, by the examination of a total of over 1,200 skins representing every race, has shown clearly that there is a striking latitudinal difference in the duration of the plumages, varying from the early summer-moult in *millaisi* (Scotland) to the almost incredible state which pertains in *hyperboreus* (Spitsbergen). Here the white plumage of the cock is retained until July and resumed at the end of August; the cocks therefore breed in winter-plumage and the summer-plumage is in fact almost completely suppressed. On the contrary, the summer-plumage of the hen Ptarmigan of north Greenland and Spitsbergen is well developed, the hens being "brown" by the end of May



(Koenig, 1911). The postponement of the summer moult is, however, not peculiar to *hyperboreus*, as is shown in plate 21 by the cock of the N. Siberian *komensis* which was photographed in North Taimyr on 3rd July 1949 and which was still almost completely white.

The Spitsbergen Ptarmigan in plate 20 was encountered by D. G. Andrew and the writer on 1st July 1955 on a dry stony plateau at an elevation of about 450 feet on one of the side valleys off Sassendalen: it was extraordinarily tame and allowed us to photograph it from a distance of about ten feet. That the bird was a male was evident by the well-developed supra-orbital wattle; the feathering was almost completely white with the exception of the black loreal stripe, a few dark feathers on the car-coverts and nape, and a few dark feathers on the scapulars and greater wing-coverts: the rectrices were black. The "white" feathers were uniformly suffused with a yellowish-brown which gave the bird a very dirty appearance.

It is no new discovery that the male *hyperboreus* retains the white winter-plumage until the breeding-season is well advanced: Dresser (1871) refers to a specimen shot on 27th June when "the males had not changed a feather, though the old ones which had become very ragged and dirty would almost fall off on being touched". There is much information on this subject in Koenig (1911) and also a plate showing the male in white and the female in brown plumage. The male from which this picture was drawn was, however, found dead in Advent Bay on 15th June 1908, and the date is of no significance as putrefaction may be delayed indefinitely in Spitsbergen. The winter-plumage of *hyperboreus* is said to be very long and dense. A cock shot on 16th June and two cocks shot on 22nd June are described by Koenig as bearing the entire winter-plumage but showing some fine brown feathers on the crown and behind the ears. The white ends of the rectrices were almost completely worn away and the wattle was greatly enlarged, bright vermilion and erect. The white plumage had now assumed a dirty yellowish appearance and the long feathers of the feet were so worn that the claws were exposed.

This staining of the plumage of unmoulted birds has also been recorded from Baffin Island by Wynne-Edwards (1952) who noted the soiling of the white plumage of a cock Ptarmigan seen on 23rd June which was quite unmoulted apart from having dark feathers on the crown and nape and a spot on the breast. Koenig thought that the tarnished colour of unmoulted summer birds was due to their habit of "dust-bathing" in earth and mud.

By the middle of August the winter-moult has commenced and some Spitsbergen males are actually in full winter-plumage by the second week in September (Salomonsen, 1939). One shot on 23rd August was completely white except for the crown, back and breast (Koenig, *op. cit.*), and Kristoffersen (1931) records an observation of three pure white cocks at the South Cape of Spitsbergen on 28th September 1929.

The other plates are a beautiful series of photographs of the Swiss *helveticus*, one of the most southerly races of Ptarmigan, by René P. Bille. Plates 22 (upper) and 24 show the white winter plumage which is common to all races, and in which the spring moult has not yet commenced, but the June males in plate 23 are vastly different from the arctic races figured in plates 20 and 21, which were both photographed at the beginning of July. Even in the extreme south of its range the Ptarmigan retains a considerable amount of white throughout the year, but it is predominantly a "brown" bird in the breeding-season, by contrast to the male in plate 21 in which practically the only evidence of the breeding-season is the development of the supra-orbital wattle in what might otherwise be a winter bird.

IAN D. PENNIE

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## THE PATTERN OF MIGRATION IN 1955 AT THE EAST COAST BIRD OBSERVATORIES

By R. K. CORNWALLIS

I—SPRING

22nd March-24th April.

DURING the early spring little movement was noted at the East Coast Observatories, the weather being mainly westerly. Fair Isle was not manned, but the following less common birds were recorded at the other stations (north to south):— Isle of May, Ring Ouzel\* on 3rd April and Great Grey Shrike on the 17th; Monks' House, five *acredula* Willow Warblers between 22nd and 26th April; Spurn, Black Redstarts on 25th March and 18th and 22nd April; Gibraltar Point, Nightingale on 11th and Black Redstart on 14th April; Cley, Black Redstart on 25th March and 3rd April and Scandinavian Rock Pipits on 3rd and 18th April.

\*Scientific names of species mentioned in the text are given on pages 117-118.

25th-27th April.

An anticyclone over northern France and Germany brought conditions suitable for migration over the whole of southern Europe. This caused a major influx of summer-visitors at the more southerly Observatories. Willow Warblers increased to 50 at Spurn and there were hundreds of them at Cley where there were also a peak of Wheatears, a Black Redstart and three Nightingales. Gibraltar Point was not manned.

28th April-4th May.

Under the influence of the anticyclone, immigration of summer visitors continued and spread northward. Willow Warblers and Wheatears reached a peak at the Isle of May on the 30th (Fair Isle was still not manned), and Monks' House had its first Whitethroats.

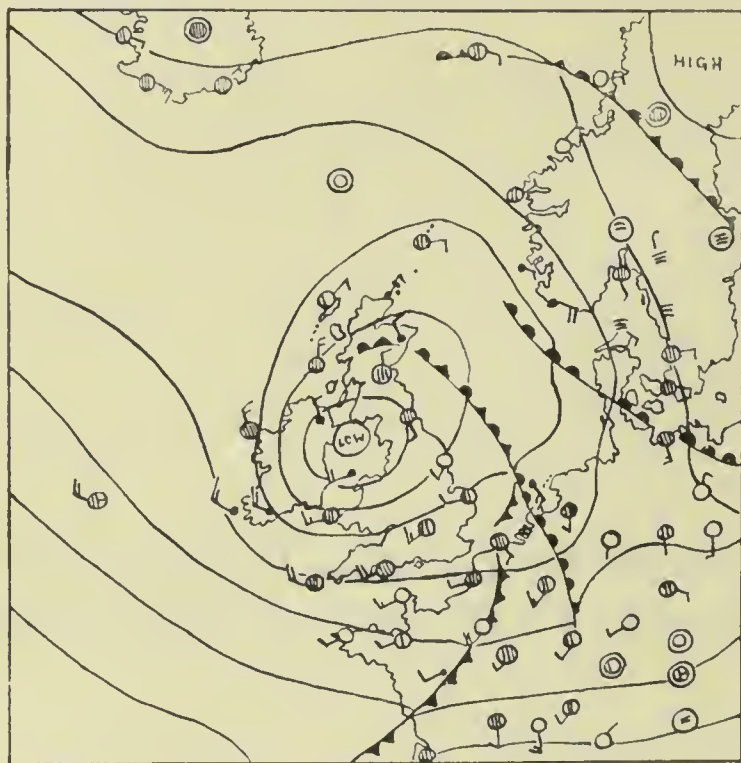
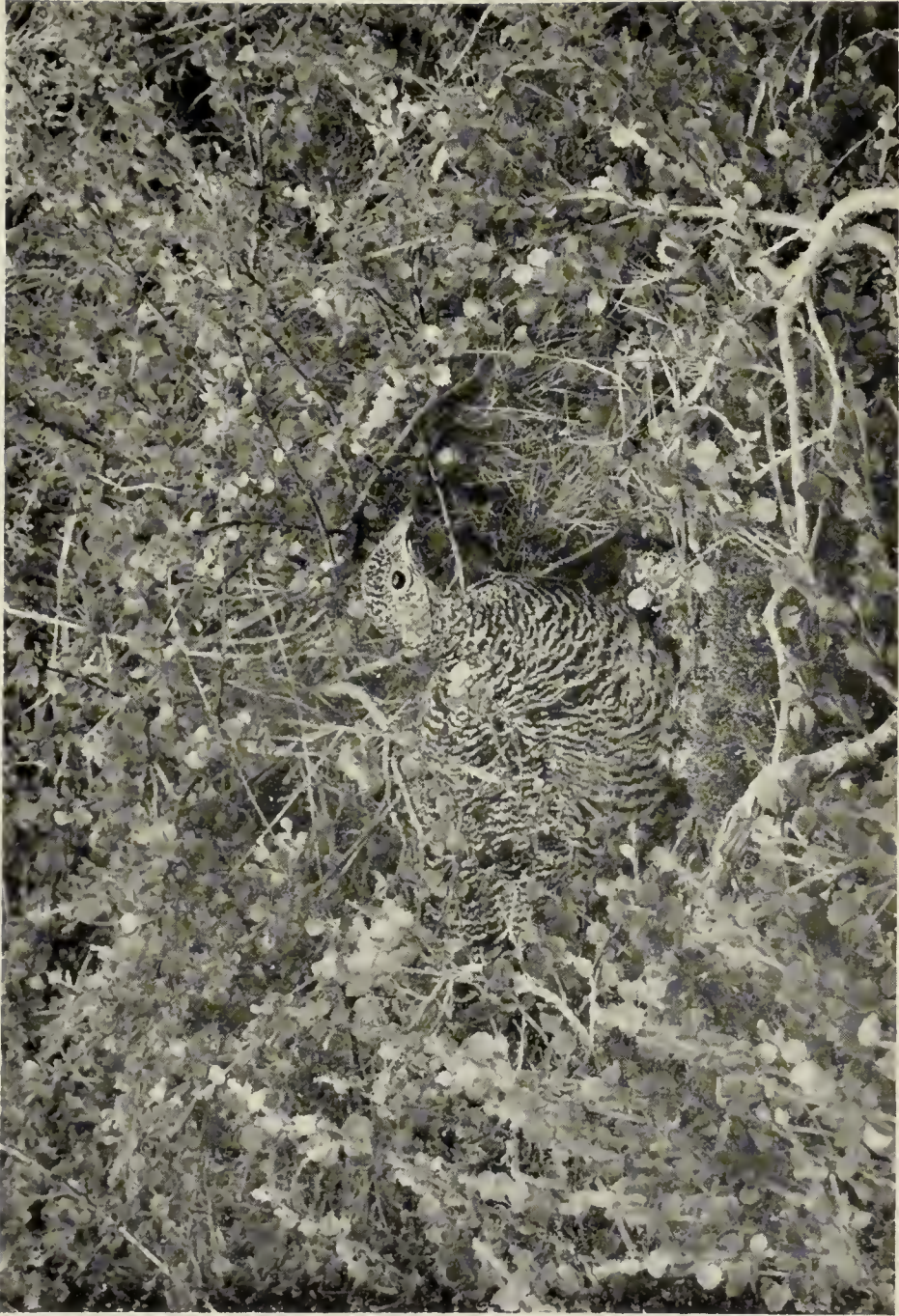


FIG. 1—MIDNIGHT, 1ST/2ND MAY 1955

On the night 1st-2nd May the easterly airstream ahead of the occlusion associated with a depression moving N.E. from Ireland combined with fog and rain in the Skagerrak area to bring a large-scale drift to Fair Isle and Shetland (Isle of May was not manned) (see Fig. 1). As in early May 1954, Continental Robins were the chief species, with Willow Warblers, Dunnocks, Whitethroats, Redstarts, Pied Flycatchers, a Wryneck and a Ring Ouzel. A Lapland Bunting and a Short-toed Lark (see *antea*, vol. xlviii, p. 512) were also seen at Fair Isle.





J. H. Sears

FEMALE PTARMIGAN (*Lagopus mutus islandorum*); N. ICELAND, JUNE 1954

In Scotland the eggs are laid in an open hollow in stony ground or in short and scanty vegetation, so that it is particularly interesting to see this well-concealed nest in a cover of Dwarf Birch in Iceland. There, where the Ptarmigan is the only gallinaceous bird and so also occupies the niche filled in Britain by the Red Grouse (*L. scoticus*), such sites are not uncommon (see pages 102-103).





A. Torenion

FEMALE PTARMIGAN (*Lagopus mutus millaisi*)  
CAIRNGORMS, SCOTLAND: 16TH APRIL 1949



H. Auger

FEMALE PTARMIGAN (*Lagopus mutus millaisi*)  
CAIRNGORMS, SCOTLAND: JUNE

The upper bird is moulting out of the white winter-plumage into the black and buff vermiculations of summer-dress, well illustrated in the lower photograph. This summer-plumage is subject to great geographical variation, but all races have in common the white lower breast and belly, and the white primaries (see page 103).



P. O. Swanberg

MALE PTARMIGAN (*Lagopus mutus mutus*)  
NORTH SWEDEN (67° 33' N.): 24TH JUNE 1939



P. O. Swanberg

FEMALE PTARMIGAN (*Lagopus mutus mutus*)  
NORTH SWEDEN (67° 33' N.): 24TH JUNE 1939

These two birds were photographed on the same day and illustrate the great difference that occurs in the state of moult of the two sexes: the moult into summer plumage is more complete in the females and proceeds much more rapidly (see page 103). These photographs also clearly show the small bill which is one of the characters separating this species from the Willow Grouse (*L. lagopus*).





D. G. Andrew

MALE PTARMIGAN (*Lagopus mutus hyperboreus*): SPITSBERGEN, 1ST JULY 1955

This bird, remarkably tame, was photographed quite openly from a distance of about 10 feet. It was still predominantly in winter plumage—but with the feathers loose, soiled and worn—on a date well after that when more southerly races have the black and buff upper-parts well-developed (compare with the males in plates 18 and 23). This is typical of Spitsbergen cocks, but the hens assume the brown summer plumage much earlier (see pages 103-104).



*L. Portenko*

MALE PTARMIGAN (*Lagopus mutus komensis*): TAIMYR, N. SIBERIA, 3RD JULY 1949  
 This bird is even less advanced in moult than the Spitsbergen male in plate 20, but it shows the large and erect wattle of the breeding-season. There is a striking latitudinal difference in the onset and duration of summer-plumage in this species and in northern cocks the white is retained until July and resumed at the end of August, so that in fact they breed in winter-plumage and the summer-dress is almost completely suppressed (see page 104).



R. P. Bille

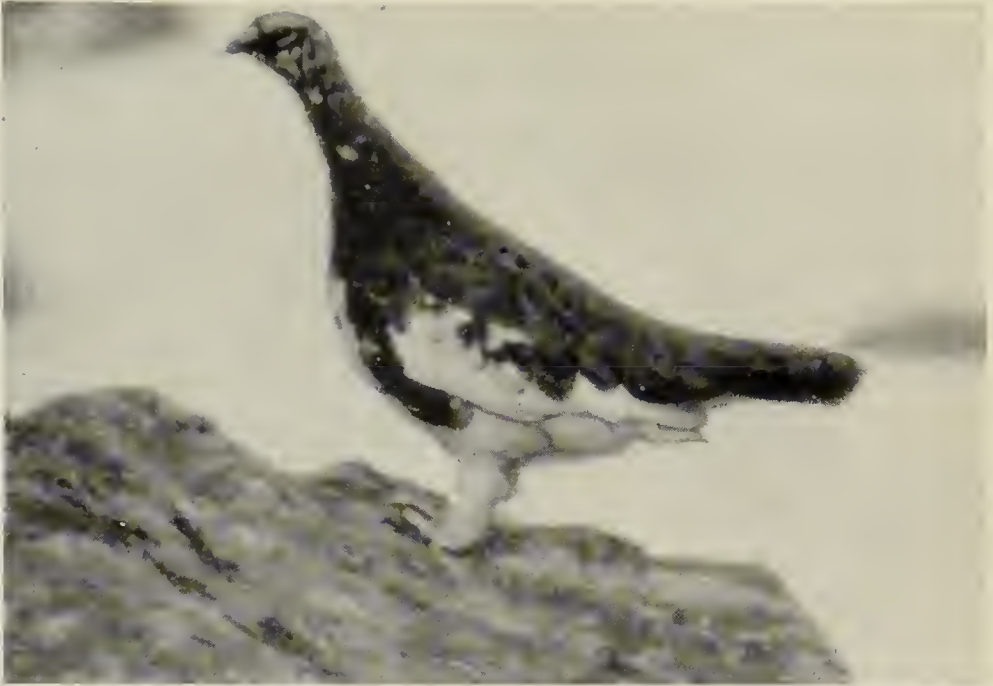
MALE PTARMIGAN (*Lagopus mutus helveticus*): SWITZERLAND, FEBRUARY



R. P. Bille

FEMALE PTARMIGAN (*Lagopus mutus helveticus*): SWITZERLAND, AUGUST  
These two photographs show the extremes of Ptarmigan plumage: the snow-white males in the depth of winter, and the grey-brown autumn female resembling the half-buried rocks near which she is crouching. This species is remarkable for having three moults in the year, none of them absolutely complete (see page 103).





R. P. Bille

MALE PTARMIGAN (*Lagopus mutus helveticus*): SWITZERLAND, JUNE



R. P. Bille

MALE PTARMIGAN (*Lagopus mutus helveticus*): SWITZERLAND, JUNE

Even in the southern limits of its range the Ptarmigan retains a considerable number of white feathers throughout the summer and the white flight-feathers are moulted only once a year, in autumn. But these birds are vastly different at this season from the arctic races figured in plates 20 and 21 (see also page 105).



R. P. Bille

MALE PTARMIGAN (*Lagopus mutus helveticus*): SWITZERLAND, MARCH

This exquisite picture illustrates to perfection the snow-white winter plumage relieved only by the black facial markings, and the black shafts to the primaries (the black tail is completely concealed). The black line from the bill through the eye is a character of the male alone, but it helps to separate him in winter from both sexes of Willow Grouse (*L. lagopus*) which also has a shorter and heavier bill.

*5th-23rd May.*

Weather during this period was consistently westerly and, although summer-visitors continued to arrive, no marked drift movements developed. A feature of this period was the large amount of Swallow passage—westerly at Cley, southerly at Gibraltar Point and at Spurn—and this was often on a considerable scale, e.g. 5,000+ at Spurn on the 13th. The following less common birds were recorded at Cley, which alone received a number of vagrants of south European origin: Ortolan on the 6th, three Ashy-headed Wagtails (see *antea*, vol. xlviii, p. 459) on the 16th, Woodchat Shrike (at Weybourne) on the 19th.

*24th-31st May.*

The extension to the North Sea area of a large-scale anti-cyclonic system covering the whole of southern and south-eastern Europe brought a south-easterly airstream and the renewal of drift migration to the northern Observatories. Owing to clear skies on the Continental coast this was only on a small scale, but it was varied in composition. On the 24th a small movement of Passerines was noted on Isle of May and a Continental Robin was recorded on Fair Isle. But Passerine migration was slow to develop and the resurgence of passage was at first most noticeable amongst Curlew and Whimbrel, Dunlin and Hirundines. A Bluethroat was on Fair Isle on the 25th, and on the 27th and 28th there was a small influx of Redstarts, Whitethroats, Lesser Whitethroats, Willow Warblers (one *acredula*), Blackcaps, Spotted Flycatchers, Garden Warblers and Red-backed Shrikes, with single Continental Robins, Continental Dunnocks, Bluethroats, Icterine Warblers, Wood Warblers and Pied Flycatchers. On the 29th a ridge of high pressure from the north enveloped Fair Isle and calms replaced the easterly winds. During this period there was much redetermined passage and some species, notably such day-migrants as the Hirundines, showed a second peak on the 30th and 31st. At Monks' House there was a small influx of Willow Warblers and Whitethroats on the 28th and 29th.

On the 27th a Hudsonian Whimbrel was recorded at Fair Isle (see *antea*, vol. xlviii, pp. 379-381, where the meteorological possibilities are also discussed).

*Early June.*

A slight drift-movement under the influence of light south-easterlies brought several rarities of southern or south-eastern origin to Fair Isle and Shetland. A Red-footed Falcon spent from 4th to 12th June on Fair Isle (*antea*, vol. xlviii, p. 542) and at Spiggie there were Stone Curlew (first Shetland record), Golden Oriole and Scarlet Grosbeak. Other species also reached a peak and the strength of the Spotted Flycatcher movement through Fair Isle was quite unusual.



## I I—SUMMER

*Midsummer.*

One or two occurrences in the middle of summer are worthy of note. On 25th June a Bluethroat was recorded on Isle of May. On 25th July a Greenish Warbler was trapped at Fair Isle (see *antea*, vol. xlix, pp. 42-43).

## I I I—AUTUMN

*1st-20th August.*

With winds between north and west no passage developed until the 10th. Then a high-pressure system covered the British Isles and Norway and this stimulated Wheatear passage; a Black Redstart occurred on Fair Isle on the 11th and on the 12th Pied Flycatchers were noted at Fair Isle, Spurn, Gibraltar Point and Cley. During the following days Swallow passage was noted at Spurn (2,000 on the 16th) and Gibraltar Point. Cley recorded three Icterine Warblers during the 14th-16th and three Ortolans on the 16th.

*21st-30th August.*

The establishment of an anticyclone over Scandinavia on 21st August brought a weather-pattern typically favourable for drift and the first major movement of the autumn resulted. This reached all stations and continued for several days, reaching its greatest intensity on the 23rd (see Fig. 2). At Fair Isle, Isle of May and Monks' House Willow Warblers were the most numerous species, but at Spurn and Gibraltar Point they were absent and Pied Flycatchers predominated. Both Pied and Spotted Flycatchers were taken at Monks' House on the 21st when a strong influx of Whinchats was noted, continuing to the 29th. Fair Isle had a Reed Warbler (a rarity there), Spurn had a Bluethroat, Gibraltar Point a Hoopoe and a Red-backed Shrike, and Cley,

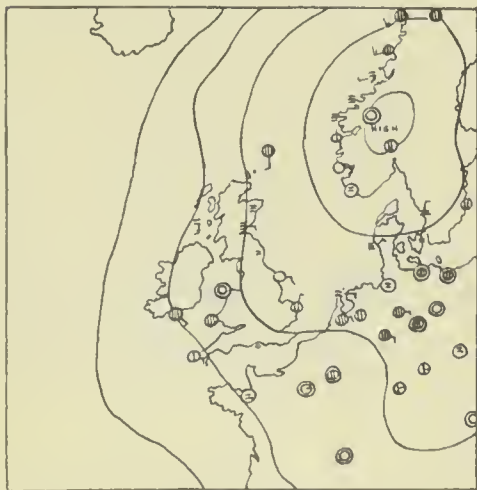


FIG. 2—06.00 HOURS,  
23RD AUGUST 1955

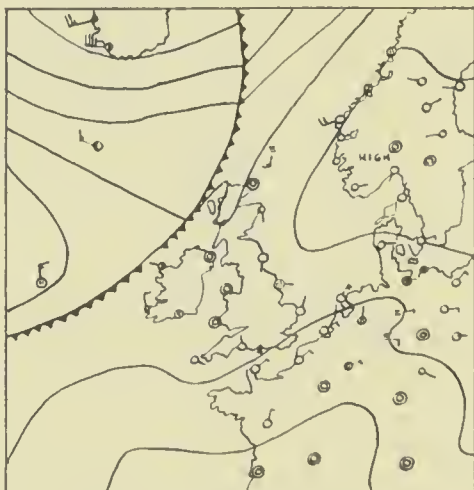


FIG. 3—MIDNIGHT,  
25TH/26TH AUGUST 1955

which seems to have been rather on the fringe of the drift, had two Tawny Pipits and two Icterine Warblers.

Drift to Fair Isle had decreased on the 24th, but Isle of May recorded a small movement of Willow Warblers and Pied Flycatchers, and a Barred Warbler was noted at Monks' House. During the next few days the anticyclone remained in a position favourable for drift (see Fig. 3), but, owing to clear skies and calm over the Continental coast, little drift developed. The two maps together illustrate clearly the importance of fog (shown by the symbol  $\Xi$ ) in promoting the initiation of drift.

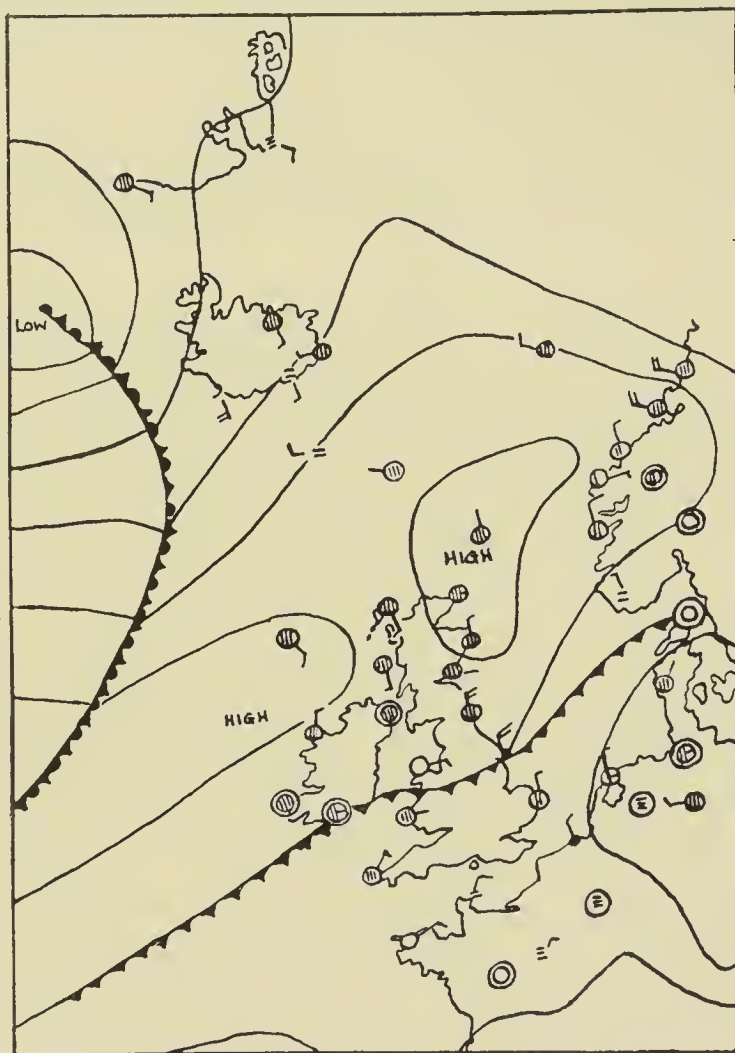


FIG. 4—06.00 HOURS, 28TH AUGUST 1955

On the 27th and 28th the anticyclone had moved westwards to cover the area between Iceland and the British Isles (see Fig. 4) and a ridge of high pressure also came in from the west. This pattern touched off the biggest movement of Wheatears ever recorded at Fair Isle (106 were trapped on the 28th) and there was also a movement of White Wagtails and Meadow Pipits on the

27th, with a Lapland Bunting and a Greenland Redpoll. These birds undoubtedly came from the north-west. Migration from this direction was unusually strong in 1955. Migration of Greenland Redpolls was, for instance, remarkably protracted, lasting from the end of August to early December, and in abnormal numbers. Twenty-one were ringed at Fair Isle; and on Foula (45 miles N.W.) there were over a hundred in the first half of September. Although no drift from the Continent developed on any scale, a number of interesting birds were recorded, viz:— at Fair Isle, a Barred Warbler and a Rose-coloured Starling on the 26th, another Barred Warbler and a Turtle Dove (a rarity on Fair Isle) on the 27th, and two Barred Warblers on the 30th; at Isle of May, a Greenish Warbler on the 27th (see *antea*, vol. xlix, pp. 43-44); at Spurn, a Barred Warbler on the 25th-26th and a Hoopoe on the 27th; at Cley, an Ortolan on the 27th, two on the 29th and one on the 31st, a Barred Warbler on the 28th, two next day, and one on the 30th, a Red-breasted Flycatcher on the 28th and Wrynecks on the 25th and 27th.

*1st-13th September.*

During this period the weather was mainly westerly except on the 7th and 8th when an anticyclone developed over the central North Sea, and this was followed by the passage of an occluded front across the North Sea on the 9th. Although drift under the influence of this anticyclone was only on a small scale, since skies were clear on the Continental coast, the following birds were noted:— at Fair Isle, a Barred Warbler; at Isle of May, a movement of Wheatears, Whinchats, Willow Warblers, and Pied Flycatchers; at Spurn, a Bluethroat and an Ortolan; at Gibraltar Point, a Barred Warbler and a few Pied Flycatchers; at Cley, a Lapland Bunting, five Ortolas, a Barred Warbler, a Bluethroat and a Wryneck, with Willow Warblers and Pied Flycatchers. Cyclonic drift before the front on the 9th affected only Fair Isle where occurred a few Pied Flycatchers, the first Tree Pipit and Blackcap of the autumn, some Whinchats and Willow Warblers and (a most unusual date) a Shore Lark.

During this period, and indeed during the whole of September, Swallow passage continued almost without interruption. Peaks were at Spurn on the 1st, 4th and 18th; and at Gibraltar Point on the 14th, 15th and 27th. Weather was consistently favourable for Swallow passage and there were no "hold-ups" as there were in 1954 (see *antea*, vol. xlviii, pp. 429-446) with the result that the peaks were much lower than in that year (2,000 in a day was the highest number recorded at either Observatory in 1955 whereas 20,000+ passed at Gibraltar Point on 11th September 1954) and there was no coincidence between the peaks at the different Observatories. House Martins in lesser numbers (maximum 800 at Gibraltar Point on the 15th) and Sand Martins accompanied the Swallows. Meadow Pipits also moved south: they were in



moderate numbers at Gibraltar Point, but at Spurn there were four peak days (*ca.* 1,000 on the 18th, *ca.* 1,200 on the 19th, 2,000 on the 24th and 1,000 on the 28th).

*14th-19th September.*

The arrival at Fair Isle on the 16th of a Melodious Warbler, two Lesser Grey Shrikes, a Barred Warbler and a Wood Warbler has already been discussed in detail by Kenneth Williamson (*antea*, vol. xlix, pp. 94-96). The movement was also noted at other observatories: at Monks' House, two Barred Warblers; at Spurn, a Scarlet Grosbeak (*antea*, vol. xlix, p. 46) and a Ring Ouzel; at Cley, a Barred Warbler and two Ring Ouzels. Gibraltar Point had a Barred Warbler on the 18th and two on the 19th.

*19th September-3rd October.*

Fine weather with light westerly winds characterized this period and the southerly coastal passage mentioned above continued steadily, being augmented by finches from about the 24th. Lapwings moved westwards at Cley on the 24th and during the 28th-30th, but this was not noted elsewhere. The only drift recorded was a small cyclonic movement to Fair Isle on the 23rd caused by the movement of an occluded front across the North Sea. This brought two Song Thrushes, two Bramblings, a Scarlet Grosbeak, a Wryneck, etc. During the period Cley had a number of interesting visitors: an Ortolan on the 21st; two Barred Warblers on the 24th and one on the 25th; a Bluethroat on the 1st; an influx of Redstarts on the 24th; Lapland Buntings on the 21st and 23rd and three which were seen coming in from the sea on the 24th; and a Subalpine Warbler on the 29th (*antea*, vol. xlix, p. 86).

*4th-21st October.*

Calm col weather on the 4th brought a Yellow-browed Warbler to Fair Isle, the first Redwings and Fieldfares to Isle of May and Lapland Buntings to Spurn and Cley. An occlusion which crossed the North Sea that night brought the first Turdidae (including 200 Redwings) to Fair Isle on the 5th; there was also a Red-breasted Flycatcher there. At Spurn there was an influx of Bramblings and Redwings.

On the 6th there was a strong cyclonic drift to Fair Isle only. This has been fully described by Kenneth Williamson *et al.* (*antea*, vol. xlix, pp. 89-93) in their account of the Thick-billed Warbler which occurred on that day. Turdidae (including 2,000-3,000 Redwings) and finches were the species principally concerned. The weather map (*loc. cit.*, p. 90) shows rather clearly why this drift was confined to Fair Isle, though a Barred Warbler at Monks' House and a Ring Ouzel at Spurn on the 7th may have been off-shoots from it. On the 7th a Scarlet Grosbeak was the only new bird at Fair Isle and many of the previous day's immigrants had departed.

South-easterly winds developing between a Baltic anticyclone

and a depression south of Iceland brought the first broad-front immigration of winter visitors from the 8th to the 10th. Lapwings came in at Spurn and Cley on the 8th, but this was not observed at Gibraltar Point. Turdidae appeared in force at Isle of May and Monks' House on the 8th and at Gibraltar Point on the 9th. On the 10th (when Gibraltar Point was not manned) Turdidae arrived, or were heard passing at night, at Spurn and Cley. This was mainly a movement of winter-visitors to Britain; and apparently little north-westerly drift developed, for the number of arrivals at Fair Isle was small—though curiously mixed, consisting of Song Thrush, Meadow Pipit, Tree Pipit, Robin and the third Lesser Grey Shrike of the autumn.

Until the 15th, weather was calm or light westerly and the migration observed was southerly coastal or redetermined. Two Yellow-browed Warblers and a Red-breasted Flycatcher at Fair Isle, a Red-breasted Flycatcher at Isle of May, and a Black Redstart, a Yellow-browed Warbler and a Bluethroat at Spurn were the most noteworthy records.

On the 16th, immigration of Turdidae was renewed briefly between Spurn and Cley and, on the 19th, cyclonic conditions brought a movement of Turdidae (notably Blackbirds), finches (Chaffinches, Bramblings and Snow Buntings), Goldcrests, a Woodlark, a Black Redstart, two Great Grey Shrikes and a Short-toed Lark to Fair Isle. On the 20th Lapwings and Starlings were noted coming in at Cley.

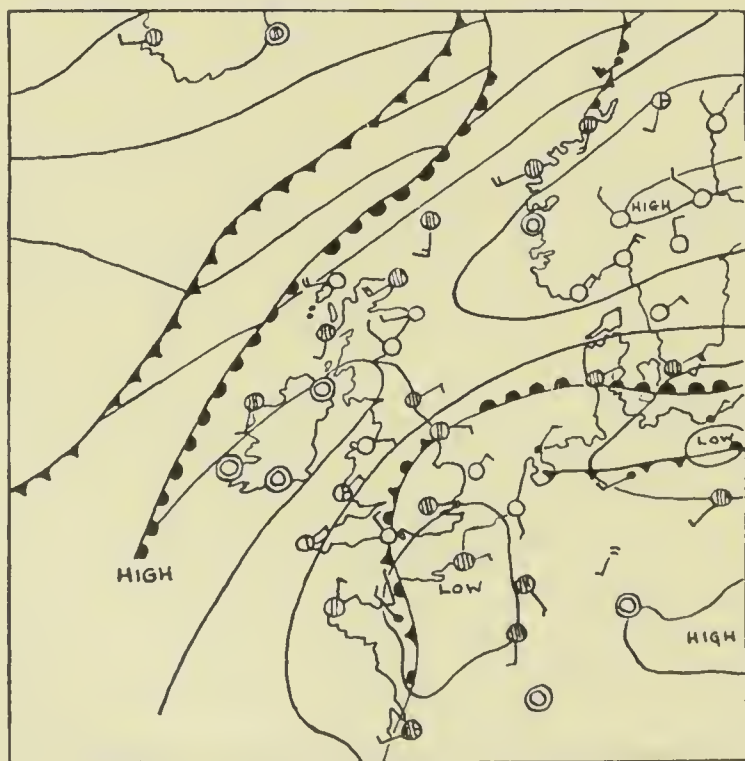


FIG. 5—MIDNIGHT, 22ND/23RD OCTOBER 1955

*22nd-25th October.*

These days saw the largest and most widespread immigration of the autumn, the 23rd being the peak day. Only a minor movement (of Turdidae and Bramblings) was noted at Isle of May and none was recorded at Fair Isle. Monks' House was not manned on the 23rd, but there were many Goldcrests still present on the 25th. At Spurn, Gibraltar Point and Cley immigration was on a very large scale and it was also recorded further south at Walberswick and in Essex (see *antea*, vol. xlix, pp. 350-353). The weather map (Fig. 5) at midnight on the 22nd-23rd shows that the northern half of Britain and Scandinavia was under the influence of a ridge of high pressure. This produced clear skies and light winds (conditions favourable for migration) from Denmark northwards, and it seems probable that birds thus stimulated to migrate ran into heavy cloud cover as they met the warm front moving up the North Sea and were thus set adrift. For this was a genuine drift-movement rather than (or, perhaps, as well as) an immigration of winter-visitors. This is shown by the large number of Continental Robins—100 at Spurn, 20 at Gibraltar Point, 500+ at Cley—which are typical late-autumn drift-migrants. Besides these, there were very large numbers of Blackbirds, Redwings and Fieldfares with smaller numbers of Song Thrushes, Goldcrests, Bramblings, Chaffinches, Rooks, Hooded Crows, Starlings and Lapwings. Spurn had a large immigration (4,000+) of Starlings on the 22nd. Great Grey Shrikes must have arrived in some numbers; there were three at Spurn, one at Gibraltar Point, three others on the Lincolnshire coast, and five at Cley. There were also a very few Redstarts at all three Observatories; and a Black Redstart, three Barred Warblers and a Shore Lark at Cley. The winter-visitors that formed part of this movement continued to come in until the 25th but drift apparently occurred only on the night of the 22nd-23rd.

*After 26th October.*

Immigration of winter-visitors was renewed on 27th October, on a small scale, and continued almost without interruption until 4th November. On the 29th there was a large immigration of Lapwings to Spurn and Gibraltar Point, and a very large arrival of Starlings on the Lincolnshire coast reflected on a lesser scale at Spurn. There was also an immigration of Skylarks at Spurn. On this day Cley recorded a large-scale movement of Turdidae, four Woodcocks were seen coming in off the sea and there was a *flava* wagtail of unknown race. 1st November was another day of Starling immigration at Cley and on the Lincolnshire coast, and this continued until the 3rd. Further north, movement was less regular and on a small scale. A Continental Bullfinch was at Fair Isle on 29th October. At Isle of May there were minor influxes of Blackbirds on 27th and 31st October and of Skylarks, with Black-



birds, Bramblings and a Black Redstart, on 3rd and 4th November.

Weather during this time was either calm or light westerly. The weather-patterns in which these immigrations of winter-visitors take place are very much less specialized than those in which drift occurs. Provided that winds are not strongly adverse, arrivals will take place in any weather. They are normally confined to the southern part of the North Sea and only reach the more northerly Observatories when a different type of drift—from south to north or south-east to north-west—develops as a result of the birds meeting an eastward-moving front when they have already embarked on their sea-crossing.

Later movements were noted at Gibraltar Point on 10th November when Hooded Crows, Fieldfares, Redwings and Bramblings came in off the sea, and at Cley on 30th November when there was a large influx of Blackbirds. In 1954 (*antea*, vol. xlviii, p. 444) Hooded Crows were unusually scarce on the East Coast, but in 1955 they were again numerous.

#### IV—DISCUSSION

The pattern of migration in 1955 at the East Coast Observatories furnished further evidence about some types of movement that have been discussed previously (*antea*, vol. xlvii, pp. 423-431; and vol. xlviii, pp. 429-446) and re-presented one puzzle.

The puzzle is the direction taken by diurnal migrants (principally Hirundines) in spring at Spurn and Gibraltar Point. This is to the south or south-west and is therefore opposed to the general direction of migration at this season. At Cley at this time the movement of these birds is westward so that there is an apparent funnelling into the Wash, just as there is in autumn. In the spring of 1955 this apparently reverse migration was particularly marked. Our knowledge about it is so limited that speculation is perhaps idle, but ideas from students of bird-migration would be very welcome. There appear to be four possibilities:—

(1) That these birds are true drift-migrants—Continental breeders that have been displaced westwards. Since they are not accompanied by other species more usually associated with drift-movements, this seems rather unlikely. Nor do they move necessarily in the weather-patterns usually associated with drift-movements.

(2) That they are true summer-immigrants to Britain, whose normal course from their winter-quarters takes them up to Holland and further north before they make a North Sea crossing.

(3) That they have in some way overshot their mark and are reversing their direction in order to get back on course.

(4) That their proper course is one that would have brought them to Britain along the south coast, but that they have been drifted to the north-east of that proper course thus reaching

TABLE I—SUMMARY OF MOVEMENTS

## A—Spring

March 22nd-April 24th: Westerly weather; little movement.  
 April 25th-30th: Anticyclonic; arrival of summer-visitors.  
 May 1st-11th: Cyclonic drift to Fair Isle.  
 May 5th-23rd: Westerly weather; arrival of summer-visitors; marked reverse Swallow passage at southern Observatories.  
 May 24th-June 12th: Anticyclonic extensions from S. Europe; drift to Fair Isle.

## B—Autumn

<i>Period</i>	<i>Date of movement</i>	<i>Type of movement</i>	<i>Probable origin of movement</i>	<i>Fair Isle</i>	<i>Isle of May</i>	<i>Monks' House</i>	<i>Spurn</i>	<i>Gibraltar Point</i>	<i>Cley</i>
Aug. 1st-20th	10th-12th	A/D	N.W. Europe	X			X	X	X
Aug. 21st-30th	peak 23rd 27th-28th	A/D Col.	Skagerrak Iceland/Greenland	XXX XXX	XXX	XX	XXX	XXX	X
Sept. 1st-13th	7th-8th 9th	A/D C/D	Skagerrak Skagerrak	X X	XX		X	X	XX
Sept. 14th-19th	peak 16th	C/D	E. France	XX		X	X	X	X
Sept. 19th-Oct. 3rd.	23rd	C/D	N.W. Europe	X					
Oct. 4th-21st	5th 6th 8th-10th 16th 19th-20th	C/D C/D A+C/WV A+C/WV C/WV+D	Skagerrak Frisian Is. N.W. Europe N.W. Europe N.W. Europe	X XXX X X	XX XX —	XX XX	X XX X	— XX — —	XX X X
Oct. 22nd-25th	peak 23rd	A+C/WV+D	N.W. Europe		X	X	XXX	XXX	XXX
After Oct. 26th	Oct. 27-Nov. 4 Nov. 10th Nov. 30th	WV WV WV	N.W. Europe N.W. Europe N.W. Europe		X		XXX XXX	XXX XX	XXX XX

KEY: A = Anticyclonic. D = Drift.

C = Cyclonic

WV = Immigration of winter-visitors.

— = Observatory not manned.

Strength of a movement is indicated by the number of Xs.

Holland and further north, and are re-orientating by the shortest route.

Events in the autumn of 1955 seem to confirm previous experience in two aspects:— (i) Reference to Table I (B) will show that again cyclonic drifts were almost confined to the most northerly Observatories (see *antea*, vol. xlviii, p. 443). (ii) Autumn 1955 was mainly one of "fine" weather. In these conditions the southerly coastal passage proceeded steadily, there were no "hold-ups" and there was no coincidence in the peak-movements noted at the different Observatories (see *antea*, vol. xlvii, p. 430; and vol. xlviii, p. 444).

The drift of 16th September took place in a synoptic situation unique among those studied in the last six years. This is fully discussed by Kenneth Williamson (*antea*, vol. xlix, pp. 94-96). Involving, as it did, a long *overland* drift down-wind in the opposite direction of the true migration, it may throw light on the conditions which could contribute to trans-continental vagrancy and is therefore worthy of particular attention by students of bird-migration.

Two types of drift-movement—trans-Atlantic drift on the south side of a depression and cyclonic drift off the Norwegian coast—do not seem to have occurred in 1955, at any rate on any scale.

Migration to Fair Isle from the north-west—Faeroe, Iceland, Greenland—was in great strength in 1955. It seems, therefore, appropriate to review the weather-patterns which bring these movements. The following notes are by Kenneth Williamson and are copied verbatim from the *Fair Isle Bulletin*, vol. 3, no. 2, p. 66.

A. Cyclonic drift from south or east Greenland in a westerly airstream of the southern part of a depression in the Denmark Strait or Iceland region; similarly from Iceland with a low centred east of that country.

B. Anticyclonic drift round the north-eastern perimeter of a ridge of an Azores high with a westerly wind veering northerly in the Iceland-Faeroe area; or from Iceland in the northerly air-flow between an anticyclonic ridge from the south and a depression situated over northern Norway.

C. Direct southward movement from Iceland-Faeroe under clear anticyclonic conditions firmly established in this region, either an eastwards-moving high from the Atlantic or a ridge extending north-west from Europe.

D. Direct southward movement through a fine-weather col, usually between highs over Britain and Greenland, and lows over Scandinavia and mid-Atlantic.

E. Direct movement from Faeroe and Shetland (occasionally Iceland) under "cyclonic variable" conditions in the zone of calm or light variable winds between two low pressure centres in the same system.

F. Direct movement south from the calm central area of a filling low in the Shetland-Faeroe region.



The large passage of Wheatears on 27th-29th August was in type C weather (see also Fig. 4). The protracted passage of Greenland Redpolls took place in several types of weather-pattern: in type A on 10th, 24th and 29th-30th September; in type B on 26th-27th August and 17th-18th October; and in type C on 1st-2nd September, 31st October and 15th November. The migration from the north-west of many other species is described in detail in the *Fair Isle Bulletin* cited above.

#### ACKNOWLEDGEMENTS

Information for the above review has kindly been supplied by the officials of all the East Coast Bird Observatories, both in their published reports and in private communications. Without their willingness to undertake what is often a considerable amount of extra work done in their spare time, these attempts to present a broad picture of East Coast migration would not be possible.

#### ADDENDUM—NOTE ON THRUSHES IN MIDDLESEX, AUTUMN 1955

P. W. P. Browne, by listening nightly, recorded the amount of thrush migration at East Bedfont, Middlesex. His peak nights—10th, 16th, 18th, 22nd (especially strong passage), 23rd-26th, 31st October, 1st, 5th, 6th, 10th-15th November (in each case the date is that of the first half of the night, whereas in the foregoing paper dates are of the morning following a movement)—will be seen to correlate rather closely with the immigrations recorded at the East Coast Observatories so long as they were regularly manned.

#### APPENDIX—SCIENTIFIC NAMES OF SPECIES MENTIONED IN THE TEXT

Red-footed Falcon ( <i>Falco vespertinus</i> )	Whitethroat ( <i>Sylvia communis</i> )
Lapwing ( <i>Vanellus vanellus</i> )	Lesser Whitethroat ( <i>Sylvia curruca</i> )
Woodcock ( <i>Scolopax rusticola</i> )	Subalpine Warbler ( <i>Sylvia cantillans</i> )
Curlew ( <i>Numenius arquata</i> )	Song Thrush ( <i>Turdus philomelos</i> )
Whimbrel ( <i>Numenius phaeopus</i> )	Redwing ( <i>Turdus musicus</i> )
Hudsonian Whimbrel ( <i>Numenius phaeopus hudsonicus</i> )	Ring Ouzel ( <i>Turdus torquatus</i> )
Dunlin ( <i>Calidris alpina</i> )	Blackbird ( <i>Turdus merula</i> )
Stone Curlew ( <i>Burhinus oedicephalus</i> )	Wheatear ( <i>Oenanthe oenanthe</i> )
Turtle Dove ( <i>Streptopelia turtur</i> )	Whinchat ( <i>Saxicola rubetra</i> )
Hoopoe ( <i>Upupa epops</i> )	Redstart ( <i>Phoenicurus phoenicurus</i> )
Wryneck ( <i>Jynx torquilla</i> )	Black Redstart ( <i>Phoenicurus ochruros</i> )
Short-toed Lark ( <i>Calandrella brachydactyla</i> )	Nightingale ( <i>Luscinia megarhynchos</i> )
Woodlark ( <i>Lullula arborea</i> )	Bluethroat ( <i>Cyanosylvia svecica</i> )
Skylark ( <i>Alauda arvensis</i> )	Continental Robin ( <i>Erithacus r. rubecula</i> )
Shore Lark ( <i>Eremophila alpestris</i> )	Reed Warbler ( <i>Acrocephalus scirpaceus</i> )
Swallow ( <i>Hirundo rustica</i> )	Thick-billed Warbler ( <i>Phragamaticola aedon</i> )
House Martin ( <i>Delichon urbica</i> )	Melodious Warbler ( <i>Hippolais polyglotta</i> )
Sand Martin ( <i>Riparia riparia</i> )	Icterine Warbler ( <i>Hippolais icterina</i> )
Golden Oriole ( <i>Oriolus oriolus</i> )	Blackcap ( <i>Sylvia atricapilla</i> )
Hooded Crow ( <i>Corvus cornix</i> )	Barred Warbler ( <i>Sylvia nisoria</i> )
Rook ( <i>Corvus frugilegus</i> )	
Fieldfare ( <i>Turdus pilaris</i> )	
Garden Warbler ( <i>Sylvia borin</i> )	

Willow Warbler ( <i>Phylloscopus trochilus</i> )	Ashy-headed Wagtail ( <i>Motacilla flava cinereocapilla</i> )
Greenish Warbler ( <i>Phylloscopus trochiloides</i> )	Great Grey Shrike ( <i>Lanius excubitor</i> )
Wood Warbler ( <i>Phylloscopus sibilatrix</i> )	Lesser Grey Shrike ( <i>Lanius minor</i> )
Yellow-browed Warbler ( <i>Phylloscopus inornatus</i> )	Woodchat Shrike ( <i>Lanius senator</i> )
Goldcrest ( <i>Regulus regulus</i> )	Red-backed Shrike ( <i>Lanius collurio</i> )
Spotted Flycatcher ( <i>Muscicapa striata</i> )	Starling ( <i>Sturnus vulgaris</i> )
Pied Flycatcher ( <i>Muscicapa hypoleuca</i> )	Rose-coloured Starling ( <i>Sturnus roseus</i> )
Red-breasted Flycatcher ( <i>Muscicapa parva</i> )	Greenland Redpoll ( <i>Carduelis flammea rostrata</i> )
Dunnock ( <i>Prunella modularis</i> )	Continental Bullfinch ( <i>Pyrrhula p. pyrrhula</i> )
Meadow Pipit ( <i>Anthus pratensis</i> )	Scarlet Grosbeak ( <i>Carpodacus erythrinus</i> )
Tawny Pipit ( <i>Anthus campestris</i> )	Chaffinch ( <i>Fringilla coelebs</i> )
Tree Pipit ( <i>Anthus trivialis</i> )	Brambling ( <i>Fringilla montifringilla</i> )
Scandinavian Rock Pipit ( <i>Anthus spinoletta littoralis</i> )	Ortolan Bunting ( <i>Emberiza hortulana</i> )
Pied/White Wagtail ( <i>Motacilla alba</i> )	Lapland Bunting ( <i>Calcarius lapponicus</i> )
Yellow Wagtail ( <i>Motacilla flava</i> )	Snow Bunting ( <i>Plectrophenax nivalis</i> )

## NOTES

**Ortolan Bunting in Middlesex.**—On the morning of 2nd September 1956, I was walking along the northern bank of the River Brent where it flows into the Brent Reservoir, Middlesex, noting the many migrants which had arrived in the comparative calm after a period of strong N.E. winds; these included White-throats (*Sylvia communis*), Willow Warblers (*Phylloscopus trochilus*) and Reed Warblers (*Acrocephalus scirpaceus*), and a strong overhead passage of Hirundines. At 12.05 I flushed a female Ortolan Bunting (*Emberiza hortulana*) from the dense growth of sedge along the river bank. It rose with a loud call, and then concealed itself in some willows at a height of 3-4 feet above the ground. It returned later to the sedges where I had it under observation at a range of 15 feet for some ten minutes. It called twice with a clear incisive *z-tick*—really a monosyllabic call but with a slurred sibilant *z*; the call seemed loud and penetrating for a bird of that size. The plumage description of the bird is as follows:

Head, dirty greenish-brown with dark streaks on top; mantle, scapulars and back, slightly rufous with conspicuous black streaks; primaries and secondaries dark brown and lined on the edges with pale buff, with buffish edgings to the median and greater wing-coverts; underparts, buffish-yellow, but slightly paler on throat, and breast band of darker brown blotches and streaks. There was a pale buffish crescent sweeping from near the base of the bill and round the ear coverts to the nape of the neck, becoming thence a faint, dark line to the eye, which was surrounded by a pale yellow orbital ring. There was also a black malar stripe underlying the crescent. The tail feathers were brownish-black with the outside pair banded white across the webs. The bill, feet and legs were a clear reddish-brown.

This would seem to be the first Ortolan Bunting in Middlesex

for 88 years, and there appear to be only six previous records for the county (involving eight birds), the last of them and one other having also been at the Brent Reservoir, in 1867 and 1868.

ERIC SIMMS

[Inland records of Ortolan Buntings have been few in the present century and the only comparable record in recent years seems to have been the one in Hertfordshire in 1953 (*antea*, vol. xlvii, pp. 446-447). It should be added that the bird seen by Mr. Simms occurred at a time when there was a most unusual passage, particularly in coastal areas, of a number of species, common and less common, including a sprinkling of Ortolan Buntings which were recorded on the East and South Coasts and in the Irish Sea.—EDS.]

**Little Bittern in Lancashire.**—Between 8th and 12th August 1956, there was a Little Bittern (*Ixobrychus minutus*) at Marton Mere, Blackpool, Lancashire. It was seen by D.J.M. at 9 p.m. (B.S.T.) on the first day, when it appeared to be terrified by about 500 Starlings (*Sturnus vulgaris*) coming over its head to roost in or near the reeds. It came out on to the open water and, with upstretched wings (showing white under-wings), ran frantically about on the tops of lily-pads. This behaviour was not witnessed on other evenings so we assumed that the bird was a new arrival.

On 9th August, and subsequently, the bird was seen by N.H., M.J. and four other observers. It was near one end of the mere and could be viewed, at 30 to 40 yards, from a convenient tree on the opposite side. On one occasion four of us in this tree saw the crouching bird, on the water side of the reeds, as a mottled egg-shaped object. [It was small compared with the bodies of Coot (*Fulica atra*) and Moorhen (*Gallinula chloropus*) which were also present.] Then the long neck emerged slowly from the body and remained at full vertical stretch as the bill took a morsel from the leaves of a willow, and for some seconds afterwards. The throat was warm buff and the under-parts, buff at the sides, had a white vertical area down the centre. Next the bird was seen in side view as it walked a few strides with neck extended horizontally. The cheeks and sides of neck were warm buff. The upper-parts were brown, but there was some black on crown and nape. The light area on the closed wing was not very conspicuous. The bill was yellow. As the bird mounted two or three feet into a willow the legs showed greenish. When it re-appeared it plunged with head, neck and legs into the water and caught a fish or other prey. Finally it flew, with neck extended, for a short distance and struck into the reeds well above water level. During this flight the large light wing-patch was seen to better advantage.

D. J. McCULLAGH, N. HARWOOD and M. JONES

**Green-winged Teal in Hampshire.**—During the morning of 18th March 1956, a male Green-winged Teal (*Anas crecca carolinensis*)



was seen at Titchfield Haven, Hampshire, by a number of observers including John Everett, Roger Brown, Alan Searle and the writers. It was in company with a small number of Teal (*A. c. crecca*) and was distinguished from the drakes by the white vertical mark at the sides of the breast and the absence of a white horizontal line above the flanks. The buff face-markings were very obscure, being reduced to a short buff line just below the eye (E.G.R.). It also had a much more buff-coloured breast than the Teal, making it easy to pick out when head on (R.H.D.).

E. G. RICHARDS, C. SUFFERN and R. H. DENNIS

**Wood Sandpiper in Ross-shire.**—A Wood Sandpiper (*Tringa glareola*) was observed by us on the shore by Chanonry Ness, Black Isle, Ross-shire, on 3rd October 1956. The bird was apparently resting there while on a movement flight and was only present for an hour or two. It was almost certainly a bird of the year.

*The Handbook* describes the Wood Sandpiper as a "rare vagrant" in Scotland, but no record of its previous presence in this locality is known to us. JOHN SHAW-MACKENZIE and JOHN LEES [This is also a fairly late record, and after the end of the main passage through the British Isles.—EDS.]

**Pratincole in Devon.**—On 15th May 1956, Mr. and Mrs. I. W. Cameron and Mrs. F. Cameron saw an unusual bird flying over the Great Field at Braunton, North Devon. Mr. Cameron's field-notes accurately described the bird's characteristics as those of a Pratincole (*Glareola pratincola*). On the morning of 18th May Mrs. I. W. Cameron and I again saw the bird in exactly the same place and were able to observe it in good light, at times to within 15-20 yards, for about half an hour.

The bird was about the size of a Golden Plover (*Charadrius apricarius*), with olive-brown upper-parts and light buffish under-parts. The distinct black stripe bordering the pale throat could be clearly seen. There was a small red patch at the base of the dark bill. In flight the long, forked black tail with a white base and the long pointed wings were obvious. In flight, also, the under wings were seen to be chestnut. Whilst under observation it alighted only on the bare soil of a potato field and ran between the empty furrows. When approached too closely it got up and flew in a distinctly tern-like manner to another part of the field.

Although a careful watch was kept for several subsequent days on the Great Field, the bird was not seen again. T. G. COWARD

**Black Terns in Ross-shire.**—On 2nd October 1956, we found a party of eight Black Terns (*Chlidonias niger*) feeding with two Sandwich Terns (*Sterna sandvicensis*) over the sea a short distance from the shore of Chanonry Ness, Black Isle, Ross-shire. Later the whole group settled on the shore and we were able to see that there were five adult Black Terns in winter plumage and three birds of the year.

This species has not previously been recorded north of Aberdeen on the Scottish coast. JOHN SHAW-MACKENZIE and JOHN LEES

[Full descriptions of these birds, which form the first record for Ross-shire, have been supplied. It is perhaps of interest to add that in both of the large-scale passages of Black Terns in 1954, spring and autumn, the most northerly records were from no farther north than the Isle of May (*antea*, vol. xlviii, pp. 169 and 301).—EDS.]

**Whiskered Tern in Radnorshire.** — A Whiskered Tern (*Chlidonias hybrida*) was present at Llan Bwch-llyn, Radnorshire, on 21st and 22nd April 1956. The bird was rather less than two-thirds the size of some Black-headed Gulls (*Larus ridibundus*) among which it sometimes flew. On one occasion, one of the gulls chased it for about thirty yards. The outstanding features of the Whiskered Tern were its general dark appearance above with jet black top to the head, white chin and cheeks and the very dark belly. Also noted were the white underside to base of the tail and the dark red bill. I watched it for almost an hour on 21st April and, except for one period of about ten minutes, it was flying and feeding in typical Black Tern (*C. niger*) fashion; swooping to the surface of the water from which it was apparently taking food. During the ten minutes referred to, it was flying over a small area of reeds and swamp at one side of the lake. It flew round and round, backwards and forwards, at heights from 20 to 80 feet.

In view of the unusual nature of this occurrence, I called on Mr. Arthur Brook that afternoon to ask him to go and confirm it. He was able to visit the lake with Col. H. Morrey Salmon and they saw the bird just before sun-down. They had no hesitation in confirming it as a Whiskered Tern. On 22nd April it was seen in the morning by Mr. R. H. Baillie, but could not be found in the afternoon.

This record appears to be the first for Wales and the twenty-sixth for Great Britain where it has not apparently been recorded before in April.

G. C. LAMBOURNE

**Terns nesting underground.**—On 23rd June 1952, we visited The Skerries, a group of small islands off Anglesey. A colony of various species of terns (*Sterna* spp.) is normally present at that time of year, but although eggs had been laid all of the birds had deserted and the clutches had been cleared by gulls (*Larus* spp.).

While searching for nesting Puffins (*Fratercula arctica*) we were amazed to find four terns' nests, containing eggs, well concealed in burrows in the thick turf of *Spergularia maritima*. There were three pairs of eggs and one singleton, all resting on pads of *Spergularia* fragments, and all at distances up to one foot from the entrance. In each case the sitting bird would have been wholly concealed. These eggs too had been forsaken, and

laboratory examination revealed well developed embryos which had been dead for several days.

The reason for the failure of the colony was given by the lighthouse keepers as predation by Carrion Crows (*Corvus corone*) and gulls. It is presumably possible that some birds took to nesting underground to escape predation, but that on the departure of the main colony the colonial instinct bettered the brood instinct and the subterranean nesters left with the others. Human interference in the siting of the eggs was considered highly improbable.

Definite identification of the eggs in the absence of their owners was not possible, but we considered that they certainly belonged to either Common or Arctic Terns (*S. hirundo* or *macrura*).

P. E. S. WHALLEY and M. J. WOTTON

[Roseate Terns (*S. dougallii*) also breed on the islands concerned, but the authors inform us that, while actually examining the eggs, they considered the possibility of their belonging to this species and discarded it, adding that in their experience the eggs of Roseate Terns are quite distinctive, a point which Major W. M. Congreve kindly confirms. Roseate Terns' nests are sometimes half-hidden in hollows—see for example, page 143 (site 3) in *Sea Terns or Sea Swallows* by G. Marples and A. Marples (1934), and we ourselves have seen such nests—so that the change to a completely concealed site as described in this interesting note would be less surprising than with Common or Arctic Terns.—EDS.]

### **Regular drumming of Great Spotted Woodpecker in September.**

—Since the publication of *The Handbook*, where the chart of song-periods gives no drumming of the Great Spotted Woodpecker (*Dendropocos major*) between mid-May and mid-December, there have been several notes on the subject in *British Birds*, the last of which (*antea*, vol. xl, p. 160) gives five dates in September 1946 in the New Forest. As, with one exception (*antea*, vol. xxxix, p. 254), these are the only recorded instances in September and then only spasmodic, it may be of interest to record that in September 1956 at Sway, Hampshire, I saw and heard drumming on the 13th (when two males were drumming in answer to one another), 14th, 15th, 17th, 20th, 21st, 22nd and 23rd. Drumming was not heard again until 9th October.

EDWIN COHEN

**Some internal parasites from an Iceland Redwing.**—A dead Redwing (*Turdus musicus*) was picked up at Beddington Sewage Farm, Surrey, on 4th February 1956. Later, on more detailed examination, it was found to belong to the Iceland race (*T. m. coburni*). The intestines of the bird were then opened and examined for parasitic worms, the following four being found:—

(1) *Dilepis undula* (Schrank, 1788): In the files of the British Museum (Natural History) there is only one previous British record of this cestode from a Redwing, but unfortunately no sub-



specific details are given. The bird was stated to "be on northward migration" in the Isle of Wight on 28th March 1928. Sprehn 1932 (*Lehrbuch der Helminthologie*, p. 427) records this species from the Redwing, and also from the Mistle Thrush (*Turdus viscivorus*), Fieldfare (*Turdus pilaris*), Song Thrush (*Turdus philomelos*), Blackbird (*Turdus merula*) and Alpine Ring Ousel (*Turdus torquatus alpestris*), as well as from many species of crow (*Corvidae*) and other Passerines.

(2) *Porrocaecum ensicaudatum* (Zeder, 1800): There is one British record of this species of nematode from a Redwing, this being from the same bird as *Dilepis undula*. Sprehn states (p. 533) that this parasite is found in the Redwing, as well as the Moorhen (*Gallinula chloropus*), Lapwing (*Vanellus vanellus*), Carrion Crow (*Corvus corone*), Jay (*Garrulus glandarius*), Song Thrush, Blackbird, Pied Wagtail (*Motacilla alba*) and Starling (*Sturnus vulgaris*).

(3) *Prosthorrhynchus transversus* (Rud., 1819): There is no record at the British Museum of this species of Acanthocephala being previously recorded from a Redwing in Britain. Previous British examples have been obtained from the Lapwing, Stone Curlew (*Burhinus oedichenus*), Great Spotted Woodpecker (*Dendrocopos major*), Wren (*Troglodytes troglodytes*), Song Thrush, Blackbird, thrush (*Turdus* sp.) and Starling. The specimen in this particular case was immature.

(4) *Anomotaenia constricta* (Molin, 1858): This is the first Museum record of this cestode from a Redwing in the British Isles, previous British hosts being the Carrion Crow, Rook (*Corvus frugilegus*), Song Thrush, Blackbird and Starling. Sprehn (p. 430) includes among the hosts the Raven (*Corvus corax*), Jackdaw (*Corvus monedula*) and Magpie (*Pica pica*).

I must thank Mr. Stephen Prudhoe of the British Museum (Natural History) for identifying the specimens.

R. E. SCOTT

**Blackbird feeding brood of Dunnocks.**—In mid-May 1956, I noted several birds' nests in our garden hedge at Ellington, Huntingdonshire, including those of a pair of Blackbirds (*Turdus merula*) and a pair of Dunnocks (*Prunella modularis*). On 26th May I was surprised to see the cock Blackbird with worms in his beak, as I thought the Blackbird's eggs could not have hatched, a fact which I confirmed by checking that the hen was still sitting on a clutch of five. I then discovered that the cock Blackbird was taking the worms to the Dunnock's nest, which was situated about 4 feet away. The young Dunnocks were well grown and the cock Blackbird continued to feed them regularly until they flew. He took very small worms (as for newly hatched Blackbirds), but he must have made a mistake on one occasion, as one of the parent Dunnocks brought a half of a large worm from the nest and dropped it in the garden. Once I saw him fly with his beak open

at one of the parent birds as it sat on a post; it flew off and he did not pursue it. This was the only sign of friction that I noticed between the two species.

The cock Blackbird fed his own brood as usual when they hatched.

RUTH E. LOVELL

**Robin's nest of unusual construction.**—In May 1956, I found a nest of a Robin (*Erithacus rubecula*) at Sevenoaks Weald. This nest was built in dead grass on level ground, but it was completely domed and was approached by a tunnel through the grass about five inches long. Oak leaves had been used to line the tunnel, which was as smooth and well constructed as the nest itself. The incubating bird could be seen only by lying on the ground and looking along the tunnel.

Dr. D. Lack comments upon several similar nests in *The Life of the Robin*, Chap. VII, but the lining of the tunnel appears to be unusual.

F. L. HUDSON

**Melodious Warbler in Devon.**—I watched a Melodious Warbler (*Hippolais polyglotta*) on several occasions between 21st July and 22nd August 1956, at West Browns Farm, Langtree, Torrington, Devon. Viewed from 6 to 20 yards range through binoculars, its under-parts were lemon-yellow right down to the underside of the tail, and the eye-stripe was the same colour; the closed wing was brownish and showed no light patch; the legs were slightly bluish; the bird was larger in size than a Willow Warbler (*Phylloscopus trochilus*) or Chiffchaff (*Ph. collybita*). It would be seen only for about an hour and a half each day from 1.00 to 2.30 p.m. when it was very nervous and would fly away if it heard an unusual noise. It spent most of this time in some peas and beans whence it would fly to some old apple trees.

M. J. McVAIL

I was able to see this bird on 22nd August at 2.30 p.m. It was appreciably larger than a Willow Warbler and had a noticeably large bill while the wings were not long enough for it to be an Icterine Warbler (*H. icterina*). It showed pale edgings to each feather on the closed wing but no continuous light patch. It was identical in size, shape and colour with a number of Melodious Warblers which I have examined in the field in France. It did not call or sing.

F. R. SMITH

**Abnormal song of Chiffchaff.**—Dr. J. S. Huxley's note (*antea*, vol. xlix, p. 154) on an abnormal Willow Warbler (*Phylloscopus trochilus*) song prompts me to place on record an abnormal Chiffchaff (*P. collybita*) song, which I heard in Ken Wood, Middlesex, on 21st June 1942, and again on the 28th and 29th. The full song was a more or less indiscriminate mixture of the normal *zip-zap* note, which was rather infrequent; a curious double note *chee-ouee*, which was unlike anything else I could think of; a chaffinch-like

(or redstart-like or lesser-whitethroat-like) trill *wee*<sup>3-4</sup>, which was suggestive of the note of *Ph. c. tristis* (which I have not heard) as described in *The Handbook*; and the normal soft *chirr-chirr* note. A typical phrase ran *chee-ouee*<sup>3</sup>, *zip-zap*<sup>2</sup>, *wee*<sup>4</sup>, *chee-ouee*<sup>2</sup>. The *chee-ouee* appeared to take the place of the *zip-zap* in the normal song, as it had exactly the same rhythm but was much fuller.

R. S. R. FITTER

**Brown Flycatcher in Northumberland.**—On 9th September 1956, T. H. Alder, A. Blackett, J. Bryce, A. Childs, B. Little, W. D. Ryder and the writer were walking through a large hollow among the sand dunes on the eastern shore of Holy Island, Northumberland, when T.H.A. spotted a plain little bird sheltering in a small solitary elder bush. He drew our attention to this immediately, but I had only time to focus my glasses on it for a second before it disappeared into the thickest part of the bush. This quick glimpse, however, was sufficient for me to note an exciting fact—that it had a white ring around its eye. I told the party of this observation and B.L. suggested that it might be a Red-breasted Flycatcher (*Muscicapa parva*).

We sat round the bush at varying distances from 10 to 30 feet, and waited for some minutes for the bird to show itself, but it remained hidden. I then crawled carefully on hands and knees to the bush and, lying below it, saw the bird at a range of 4-5 feet. It began to flit about in the bush, on one occasion being at arm's length, and the other observers now had excellent views of it and were impressed by the definite eye-ring. From my close viewpoint the following features impressed me, and these were noted and verified by the party.

I judged the eye-ring to be off-white, not pure white. The bill was short and very broad at the base, appearing broader when seen from below than from the side, and was black in colour except for a little dull yellowish-horn at the base of the lower mandible. Rictal bristles were prominent. The unstreaked head, mantle, back and wings were a smoky grey-brown, and the darker tail was sepia-brown without white markings of any kind. With the wing folded, the primary coverts seemed paler than the rest of the wing, which otherwise appeared quite uniform in colour. The chin was white with two or three very pale streaks at the sides and the breast pale grey-brown, very softly streaked, and tapering off beautifully to the white belly. The flanks were pale buff and the under tail-coverts pale buff to whitish; the legs appeared to be dark blue-grey and the feet blackish.

When the bird became excited it flicked its wings and made a few typical flycatcher-like flights away from the bush, flitting in circles as if to look for other cover, but returning each time to the same bush. The general brown colour was then well noted, and it was suggested that the bird had the look of a small Garden Warbler (*Sylvia borin*). Except for a very faint hoarse and



indefinable note which I heard when near the bush, the bird made no other sound. We sent for a net with the intention of catching it, but during that time the bird made a longer flight of about fifty yards to a second solitary bush, from which it flew to seaweed-covered rocks, then inland where it was not seen again.

From our notes made on the spot, we were sure that we had been watching a Brown Flycatcher (*M. latirostris*) and were delighted to find, on checking *The Handbook* shortly afterwards, that our notes agreed with this in all respects. This was one of three days on which a most interesting passage of birds occurred, when on the Island and the mainland near-by Wrynecks (*Jynx torquilla*), Barred Warblers (*Sylvia nisoria*), Red-backed Shrikes (*Lanius collurio*), a Red-breasted Flycatcher (*M. parva*) and a Black Redstart (*Phoenicurus ochrurus*) were seen, while in the preceeding week Pied Flycatchers (*M. hypoleuca*) had occurred in remarkable numbers on the Northumberland coast, perhaps reaching thousands.

JAMES ALDER

## REVIEW

THE WATERFOWL OF THE WORLD. By JEAN DELACOUR.

Illustrated by PETER SCOTT (*Country Life*, London, 1956). Vol. II. 232 pages, 24 colour plates, 29 maps. £6 6s.

IN this second volume Mr. Delacour deals mainly with the dabbling or surface-feeding ducks of the genus *Anas*, in which are grouped 38 species having in some cases up to four, five or even six subspecies. Five other monospecific genera are also covered, one of these being *Merganetta*, the Andean Torrent Duck, which has not hitherto been placed among the *Anatini*, but which is now included with them in the light of Niethammer's recent work. Of the other four, three are Australasian, the exception being the Indian Pink-headed Duck (*Rhodonessa caryophyllacea*) which has not been met with since 1935 and may, it is feared, be at the point of extinction. An effort to find, study and conserve this beautiful and interesting species in its Indian haunts is one of the most important unanswered challenges facing bird protection at this time, when some still surviving birds could easily be destroyed or deprived of their habitat by people ignorant of their rarity, or by unscrupulous collectors. The New Zealand Blue Duck also urgently needs rescuing from extinction.

The genus *Anas* is remarkable for its mixture of world-wide and of narrowly restricted species, including the Pintail and Mallard, either of which may be the most numerous duck in the world. Mallards are credited with having "been able to adapt themselves better to man's world than any other species of Ducks". They have also "probably been reared and domesticated earlier than any other birds". In view of these statements it is surprising to find no mention of the Mallard's diet, except in the

case of some restricted subspecies. Ecological differences are interestingly shown; for example, between the saltwater-loving Pintail and the fresh-water, inland-haunting, vegetarian Gadwall, or the quick-moving, vegetarian Green-winged Teal of both Europe and N. America as compared with the more animal-feeding Garganey, which is grouped separately, with the Shoveler and the American Blue-winged Teal. It is interesting to have a fresh look at our familiar species in this world-wide perspective and to find, for instance, that the Mallard populations of some Micronesian islands have proved not to be a subspecies, as was first thought, but merely a group of unstable hybrids between Green-headed Mallards (*A. platyrhynchos*) from the north and Grey Mallards (*A. superciliosa*) from the south.

The book is written more for the aviculturist and taxonomist than for the field-observer, to whom it will be in several respects disappointing, apart from the very full quotation of Lorenz's descriptions of sexual behaviour and display. The value of the distribution maps is reduced by the extraordinary convention of showing breeding-range and winter-range without making any provision for the extensive areas where the two overlap. In places the compiler seems to have given up attempting to make sense of this, notably on the diagram of the Mallard which is shown neither as breeding nor as wintering in the British Isles.

The coloured plates faithfully present a wide range of plumages and the standard of reproduction is distinctly higher than in the first volume.

E.M.N.

## LETTERS

### THE BIRDS OF GLOUCESTERSHIRE

SIRS,—Material is being collected for a small book on the birds of Gloucestershire by H. H. Davis, C. M. Swaine and myself; we have already made considerable progress in assembling information. We would be grateful for further data, on the earliest possible occasion, as follows:

1. Annotated lists of species for any district.
2. Data on migration, change of status, etc., and for this the county may be divided into three main regions—the Cotswolds, the Severn Vale, and the Forest of Dean (including the Wye in Gloucestershire).
3. Reports of rare and local species, which will be treated in confidence and published only in a form which will in no way jeopardise the safety of the birds.
4. Any references to Gloucestershire birds printed in out-of-the-way publications which might otherwise be overlooked.

Information should be sent to C. M. Swaine, The Mill House, Rendcomb, Cirencester.

GUY CHARTERIS

## ASSISTANCE WANTED FOR HUNGARIAN ORNITHOLOGISTS

SIRS,—I have been in correspondence with several Hungarian ornithologists, since the recent troubles that their country has suffered, and the story they tell is very tragic. The Hungarian National Museum, with its magnificent Library and rich collection of some 80,000 skins of birds alone, has been completely destroyed and the entire staff is destitute; several eminent scientists over seventy years of age have lost everything and are near starvation. I am sure, therefore, that other British ornithologists will agree with me that we should do what we can to help our Hungarian colleagues and their families. Will any readers of *British Birds* who feel they can assist, by sending either money or clothes, get in touch with me at Hartley House, Woldingham, Surrey? I should add that the Bank of England will give permission for the export of sterling on compassionate grounds and even small sums would be valuable, as we can ensure that they are used effectively for the families of ornithologists.

GUY MOUNTFORT

## NOTICE

**Bird Observatories : new appointments.** — Mr. Kenneth Williamson, who has been Director of the Fair Isle Bird Observatory since it was established in 1948, is leaving the Observatory shortly.

To replace Mr. Williamson, the Fair Isle Bird Observatory Trust have appointed Mr. Peter Davis, formerly of Skokholm Bird Observatory. It is hoped that Mr. Davis will take up his new post at the end of April. The Fair Isle Bird Observatory will open for visitors on 1st May at reduced charges. In future, the Hostel will be run on lines similar to Skokholm. Application for bookings and for copies of the new Prospectus should be made *up to 1st May* to the Hon. Secretary, Mr. George Waterston, 5 Charlotte Square, Edinburgh, 2. Thereafter, direct to the Warden, Fair Isle Bird Observatory, Fair Isle, by Lerwick, Shetland.

At the request of the Nature Conservancy and with the concurrence of the National Trust for Scotland, Mr. Williamson will be spending most of the spring, summer and autumn months on St. Kilda in order to test its possibilities for a new Bird Observatory and to watch over the interests of wild life during construction work in connection with the Hebrides Guided Missiles Range.



28 FEB 1957

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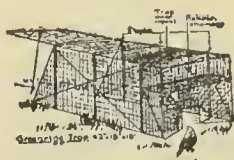
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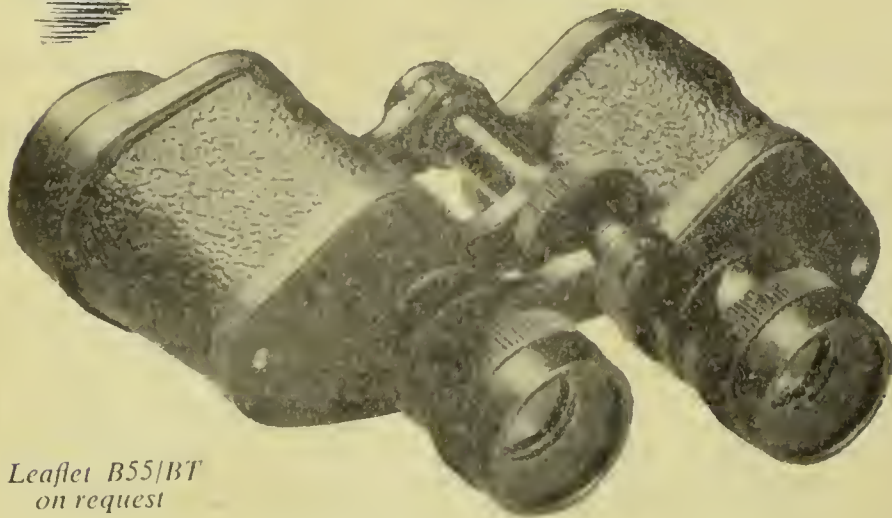
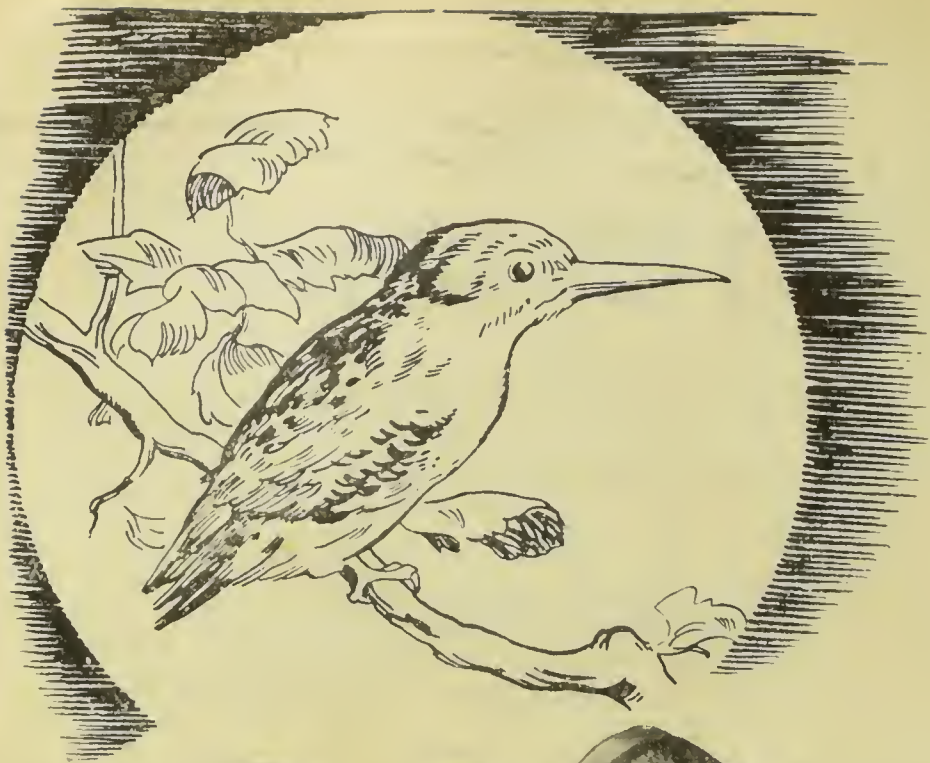
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## THREE SHILLINGS



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## CONTENTS OF VOLUME L, NUMBER 4, APRIL 1957

---

	PAGE
The rarer birds of prey: their present status in the British Isles ...	129
Golden Eagle ( <i>Aquila chrysaetos</i> ). Compiled by E. M. Nicholson	131
Goshawk ( <i>Accipiter gentilis</i> ). Compiled by P. A. D. Hollom ...	135
Kite ( <i>Milvus milvus</i> ). By Col. H. Morrey Salmon ... ..	137
Honey Buzzard ( <i>Pernis apivorus</i> ). Compiled by P. A. D. Hollom	141
Marsh Harrier ( <i>Circus aeruginosus</i> ). Compiled by E. M. Nicholson	142
Hen Harrier ( <i>Circus cyaneus</i> ). By Dr. James W. Campbell ...	143
Montagu's Harrier ( <i>Circus pygargus</i> ). Compiled by E. M. Nicholson ... ..	146
Osprey ( <i>Pandion haliaetus</i> ). By P. W. Sandeman ... ..	147
Hobby ( <i>Falco subbutco</i> ). By P. E. Brown ... ..	149
Peregrine ( <i>Falco peregrinus</i> ). By I. J. Ferguson-Lees ... ..	149
Photographic studies of some less familiar birds. LXXX—Kite. Photo- graphed by Eric Hosking (plates 25-32). Text by I. J. Ferguson-Lees	155
<i>Neotiophilum praestum</i> in birds' nests. By D. F. Owen ... ..	160
Notes:—	
Longevity of a White-fronted Goose (Lt.-Col. Niall Rankin) ... ..	161
Unusual Goshawks in Cambridgeshire and Norfolk (I. C. T. Nisbet and T. C. Smout) ... ..	164
The Hen Harrier as a breeding bird in Norway (Dr. Yngvar Hagen)	166
Distraction-display of the Crane (Guy Mountfort) ... ..	166
Moorhen feeding by "up-ending" (J. Lord) ... ..	168
Unusual call-note of Green Sandpiper (J. M. B. King) ... ..	168
The identification of Savi's, Grasshopper and River Warblers by means of song (Dr. W. H. Thorpe) ... ..	169
Bond between a captive Twite and a free one (C. K. Mylne) ... ..	171
Review:—	
<i>Natural History of Birds</i> . By Leonard W. Wing ... ..	172

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Cover photograph by Eric Hosking: Kite (*Milvus milvus*) at nest

VOL. L  
No. 4

APRIL  
1957



## BRITISH BIRDS

### THE RARER BIRDS OF PREY

#### Their Present Status in the British Isles

THE BIRDS OF PREY are a fascinating group. They always attract attention and arouse an unusual degree of admiration or persecution according to outlook. Largely for that reason their distribution and their breeding-populations are often shrouded in secrecy. Indiscriminate disclosure which could lead to persecution or disturbance of hard-pressed species would be indefensible, but secrecy can be carried too far. It is essential to both science and bird-protection that an adequate record should be kept, and that information which cannot harm the birds should be shared. Secrecy on some matters is a necessary evil which all responsible ornithologists accept in present circumstances. Secrecy for secrecy's sake, or secrecy where it can give no real benefit, is a different matter. The object of the present accounts, then, is to give an up-to-date picture of the position, an indication of the quite considerable changes which have occurred since the publication of *The Handbook*, and a summary of the main factors which appear to have been working for and against the birds. In some cases the pre-*Handbook* position is reassessed or amplified.

In preparing these accounts the necessity to guard against revealing any information that might prove detrimental to the birds concerned has been kept constantly in mind, and we have endeavoured to ensure this by consultation with others specially qualified to advise on particular sections. In the interests of security and accuracy we have been in close touch with the Royal Society for the Protection of Birds, and their help is gratefully acknowledged.

We are grateful to these and also to the considerable number of correspondents who have been good enough to send us confidential information. We must especially thank L. H. Brown, P. E. Brown, Major W. M. Congreve, Dr. J. W. Campbell, C. D. Deane, Lt.-Col. J. P. Grant of Rothiemurchus, Dr. J. D. Lockie, Col. R. Meinertzhagen, Dr. N. W. Moore,

C. E. Palmar, Lt.-Col. B. H. Ryves, Col. H. Morrey Salmon, P. W. Sandeman, Capt. H. R. H. Vaughan and A. Watson, who from their specialized knowledge have written accounts of particular species for this series, or contributed very substantially to them. In the case of the Buzzard (*Buteo buteo*), Dr. N. W. Moore collected in 1954 and 1955, chiefly through members of the British Trust for Ornithology, information for a special survey on the bird's expansion of range. He also kindly agreed to write the Buzzard article in the present series, and it was decided that, rather than write two somewhat overlapping accounts, the two should be treated together. The result is an important paper, and we are very glad to have the opportunity of publishing it in this series. It is considerably longer and more detailed than the contributions dealing with other species, and will appear in our next number. The species dealt with in this issue are Golden Eagle (*Aquila chrysaëtos*), Goshawk (*Accipiter gentilis*), Kite (*Milvus milvus*), Honey Buzzard (*Pernis apivorus*), Marsh Harrier (*Circus aeruginosus*), Hen Harrier (*C. cyaneus*), Montagu's Harrier (*C. pygargus*), Osprey (*Pandion haliaëtus*), Hobby (*Falco subbuteo*) and Peregrine (*F. peregrinus*). As announced when this series was first envisaged (*antea*, vol. xlv, p. 404), we are not considering the other three British breeding species—Sparrowhawk (*A. nisus*), Kestrel (*F. tinnunculus*) and Merlin (*F. columbarius*).

It appears that, during the period under review, there has been a definite increase in the case of the Buzzard, Kite, Hen Harrier, Marsh Harrier, and perhaps the Golden Eagle, while the Osprey may now be re-establishing a footing, and the Goshawk has returned after an absence of a century or two. It is, however, a sad fact that in almost every case the position today looks worse than it was a year or two ago. The Buzzard received a severe setback in 1954-55 through the impact of myxomatosis, coupled with increased human persecution. The Kite population has also been unsettled and reduced. The 1956 reports from Scotland indicate that the Hen Harrier fared badly on the mainland and in the Hebrides. The Golden Eagle also suffered from shooting, poisoning, cyrie-stoning and burning, and a number of pairs were missing in 1956 from regular haunts. The disturbance caused by human intervention during the Osprey's attempted nesting last season is already widely known. Marsh Harriers failed almost entirely in 1956 in one of their three strongholds. We know of no definite breeding record of the Goshawk in several recent seasons. Of the remaining species, the numbers of Montagu's Harrier are perhaps about the same as pre-war, or a little higher, although probably less than they were 10 years ago; there is no evidence of change in status of Hobby or Honey Buzzard; the Peregrine has made some recovery from war-time organized shootings.

We hope that the publication of this survey will lead to the



filling in of a number of gaps in the available information. We invite any who may be in a position to supplement or amend these accounts to communicate with us. Any confidential information will be confidentially treated, always bearing in mind that the welfare of the birds should come first.

We hope also that a special effort can now be made to review the food and the economic status of our birds of prey and to bring about a more scientific and modern attitude towards them. Prejudice and emotion, reflected in such terms as "vermin" are out of date and do no credit to our national sense of fairness and toleration. It is time that we all took the trouble to find out what the birds of prey are really like and what part they play in nature. It is time, in fact, for a new look at them.

### Golden Eagle (*Aquila chrysaëtos*)

A CLEAR PICTURE of the population and distribution of the Golden Eagle in the British Isles is not easily drawn. Early ornithologists often confused it with the White-tailed Eagle (*Haliaëtus albicilla*), which shared many parts of its range and often outnumbered it, and which also wandered freely to regions where eagles were unfamiliar and were normally reported as Golden. Much information has long been suppressed owing to intense and often secret persecution of eagles since early times. Reliable facts have been hard to get owing to the remoteness and inaccessibility of many eagle haunts and to the confusing alternate use of different eyries by the same pair.

In considering the past few years there are other complications. We know, for example, that the Buzzard (*Buteo buteo*), which has made much use of Rabbits (*Oryctolagus cuniculus*) for feeding its young, has been unable in many cases to rear broods of normal size since Rabbits were widely ravaged by myxomatosis. A careful study of Golden Eagles in Lewis (Outer Hebrides) in 1955 by Dr. J. D. Lockie and Mr. David Stephen showed that there, in the breeding-season at least, Rabbits were their main prey, supplemented by a few Mountain Hares (*Lepus timidus*) and Red Grouse (*Lagopus scoticus*) and by odd rats (*Rattus norvegicus*), Golden Plover (*Charadrius apricarius*) and Hooded Crows (*Corvus cornix*), as well as lamb and sheep carrion. This raises the question whether Golden Eagles may not equally be affected by Rabbit shortage in certain parts of their range where myxomatosis has spread, although clearly a number never were Rabbit-eaters. More generally it indicates the importance of checking local and periodic variations in the diet of Golden Eagles, and their effects upon breeding-success and numbers. Mountain Hares and Red Grouse, both of great importance as food, have fluctuated conspicuously and are now in many areas less dense than in some past periods. On the other hand, as many shepherds have

recognized, Golden Eagles on sheep moors are largely carrion-feeders, and as such they are able to maintain themselves comfortably, when natural live prey is scarce, on normal mountain sheep losses (estimated at 10 per cent, or in many cases even higher).

It is also difficult to interpret the recent spread of pairs to certain new breeding-areas. Eagle-longevity leads to a population structure in which it is perfectly possible for a reduction of fledged young to be bringing on a long-term decline while the short-term trend in adult birds taking up territories is opposite, since it results from greater breeding-success in earlier years, which can for a time mask a reversal of fortune. Moreover, it is surplus immatures which are most likely to wander. We cannot therefore safely assume that the spread of pairs to new breeding-areas is necessarily evidence of a net increase in total breeding-population. Such a spread could have resulted from a short-lived "post-war bulge" of surplus immatures due to the wartime respite for eagles, and could be offset by the effects of subsequent renewal of persecution by gamekeepers, shepherds, crofters and collectors.

Some recent reports, although not from all areas, suggest a marked increase in destruction of Golden Eagles and a disturbingly low rate of breeding-success. Occasional recent cases of killing lambs have been authenticated, particularly in the Outer Hebrides, and have been given exaggerated publicity, with the result that some shepherds have worked hard to get rid of eagles from their ground, for example by setting fire to eyries. Game-preservers have in certain cases used a variety of means, not necessarily legal, to the same end; and in other cases unselective baits and traps—set, at least ostensibly, for Foxes (*Vulpes vulpes*) and Hooded Crows—have claimed eagles as victims. Between 1951 and 1954, 26 eagles were traced as having perished by human agency, and this is far from representing the actual wastage. Immediately after the Second World War, estate-owners began to re-employ keepers and to seek to rid moors of all predatory birds. Sheep-farming also was subsidized and fostered, encroaching on former deer-forests, again to the detriment of eagle protection. Some descriptions of nests were caused by thoughtless or inexperienced bird-photographers.

It would, however, be wrong to dwell solely on adverse factors. There is a genuine and growing appreciation of the privilege of being able to preserve a pair or more of Golden Eagles, and among many keepers and shepherds the R.S.P.B. reward for successful broods is a powerful argument. Highland depopulation and the decline of grouse-moors have extended the areas on which eagles can live unmolested. Land acquired for afforestation has also substantially assisted towards eagle protection. Although the adverse factors are real and serious a surprising number of eagles appear in practice to avoid or surmount them.

According to Mr. P. W. Sandeman's inquiries, the Golden

Eagle during the early part of this century was mainly dependent on protection afforded it in the extensive and then well-watched Highland deer-forests, while it was persecuted elsewhere, especially on most grouse-moors. A single very great landowner was understood to have as many as 43 occupied eyries on his land about thirty years ago.

During the 1939-45 War the eagles enjoyed a respite from active keeping and, especially in the West of Scotland, they spread into old breeding-haunts which had not been occupied for many years. They did not, however, recolonize Orkney, although one bird appeared there for a few months in 1951-52. In Shetland they were apparently never established.

In England and Wales the Golden Eagle remains one of the rarest of casual visitors, as it has been since the breeding-stock became extinct well over a century ago. In Ireland, where extinction occurred only 30 years ago, a pair has nested annually in Co. Antrim since 1953 (for first details see *antea*, vol. xlviii, p. 272). A more striking gain has been the recent recolonization of south-west Scotland, after many years of at best only occasional breeding, by a small stock of two or three pairs. These have unfortunately been severely persecuted, like the fringe population of the S. and S.E. Highlands, where in a recent year 5 pairs managed to rear only 3 young between them. Mr. P. W. Sandeman, who has contributed to this survey the results of his own extensive and detailed studies of this species, stresses the importance of protecting such fringe pairs if the Golden Eagle is to flourish and to spread further.

He has provided figures relating to the ten years since January 1946 which indicate the following breeding numbers:—

Caithness, Sutherland and Ross-shire	...	...	29 pairs and 2 "possibles"
Inverness-shire mainland	...	...	25 " " 8 " "
N.E. Highlands (Banff and Aberdeen to Angus)	...	...	12 " " 2 " "
S. Central Highlands	...	...	16 " " 3 " "
Argyllshire mainland	...	...	28 " " 3 " "
Inner Hebrides	...	...	33 " " 2 " "
Outer Hebrides	...	...	12 " " 2 " "
Totals 155 pairs and 22 "possibles"			

All these are based on reliable reports or (in over one-third of the cases) on personal check. More than one-fifth of the pairs are regularly reported on, and three-quarters have been checked twice or more during the past ten years.

An eagle population survey of Scotland has been simultaneously undertaken by Messrs. C. E. Palmar, L. H. Brown and Adam Watson, who have also kindly placed their findings fully at our disposal. These may be summarized on a slightly different basis as follows:—

Highlands	North and West of the Great Glen	...	...	72 known pairs
"	East and East Central	...	...	37 " "
"	West and West Central	...	...	71 " "
				Total 180 known pairs



In these figures the islands from Mull northwards and the Outer Isles are included in the first group and those for the remaining islands and for S.W. Scotland with the third group. These figures are stated to be conservative, but it is pointed out that some pairs for which no up-to-date information is available may no longer exist. It is expected that the next few years' work will bring to light additional pairs in areas not yet fully examined.

Mr. Sandeman considers that his survey covered three-quarters to seven-eighths of the actual population, which would make the number of breeding pairs in all Scotland somewhere around 190. There is therefore a very fair degree of agreement between these two wholly independent surveys, and this applies to the figures for a number of the constituent areas, but for others there are fairly wide divergences, sometimes one and sometimes the other showing a markedly higher figure. Neither survey is in final form and it is very much to be hoped that in due course both will be fully brought together in order to complete the important contribution which they are making to our knowledge of the Golden Eagle. Meanwhile we express to the compilers of both our appreciation of their remarkable achievements in so difficult a field and of their generosity in making their detailed material available to us.

A good deal is already known from these investigations about present numbers and distribution of the Golden Eagle, but it is difficult to discern any unmistakeable trend until further data have been gathered and analysed. There is some evidence that the absolute minimum hunting territory which will normally support a breeding pair of Golden Eagles is somewhere in the region of 10,000 acres, and that where there is a low density of suitable prey, or where the territory includes areas unproductive of food, this acreage-requirement is very considerably increased. With increasing information of this sort it may not be many years before the potential carrying capacity of Scotland in terms of numbers of pairs of Golden Eagles can be pretty reliably assessed. Such an assessment would go far towards determining not only the limits of future possible increase of Golden Eagles, but also the maximum population likely to have been reached in the past. One complicating factor here is that we do not know enough about the past distribution and numbers of the White-tailed Eagle, and about the ecological and dietary distinctions which governed its competition with the Golden Eagle. To the extent that the White-tailed has been replaced by the Golden Eagle there may be substance in the argument that Golden Eagles are now more plentiful in some areas than they ever were in the past, but what relation this possible expansion bears to the undoubted contraction of Golden Eagle range in other directions is a matter of opinion. It is also possible that, before the Highlands became over-grazed and over-burned during the past century, there was a rather better supply of natural living prey. Further studies of carrying

capacity of different types of ground and of local and periodic variations in diet are badly needed. In this connection Dr. J. D. Lockie of the Nature Conservancy, 12 Hope Terrace, Edinburgh 9, would be grateful for any accurate and dated notes of food-remains found at Golden Eagle eyries, even if only one is visited. On what is so far known it seems unlikely that even the utmost protection would result in any spectacular increase of Golden Eagle population in the Highlands, but it could bring eagles back into areas from which they have long disappeared.

Since 1954 the Protection of Birds Act has provided a penalty of up to £25 for every Eagle or Eagle's egg destroyed or taken, with imprisonment as an alternative. The time will no doubt come when this law is effectively enforced, as a result of the intensified efforts which are being made to that end. E.M.N.

### **Goshawk** (*Accipiter gentilis*)

TWO TYPES of uncertainty envelop the early British records of the Goshawk, and place difficulties in the way of interpreting its present status. The first uncertainty concerns the reliability of early identifications, and the extent to which birds recorded as "Goshawks" were actually Peregrines (*Falco peregrinus*) or some other species. The second, and more serious, arises from the ancient practice in falconry of "enlarging" such birds in order that they might breed in a feral state in order to perpetuate and increase the supply needed for the sport. In so far as this was done with birds of British origin the complications are limited, but if it was wholly or mainly done with stock introduced from the Continent they become more serious. Early sources such as the Bayeux Tapestry suggest that hawks resembling Goshawks were carried about freely at least nine centuries ago. Were some of them indigenous or were they all imported, and if so how far did a free-living stock become permanently established?

The main difficulty in accepting the Goshawk as indigenous is probably the problem of explaining how in that case it came to die out as a breeding species so many decades before other birds of prey were seriously affected by firearms, trapping and poisoning. Short of presupposing some genetic weakness or disease this hypothesis seems to demand evidence that the Goshawk was either quite exceptionally vulnerable to pre-industrial human persecution, or was uniquely sought after, since recent experience appears to confirm that the habitat and climate available here are perfectly suitable. A satisfactory explanation along these lines might perhaps be developed, partly on the basis of the Goshawk's value for falconry, and partly on account of the eagerness of poultry-keepers and game-keepers to eliminate it, but the point needs further study. On the other side, the existence of a number of occupied eyries in the wild forests of Spey Valley up to the end of the 18th century seems well authenticated, and this is hardly

an area in which a stock of feral origin would be expected to survive later than elsewhere, especially as it is and always has been well supplied with indigenous competing birds of prey. As our knowledge of the species and its movements and habits increases, the balance of probability seems to tilt more towards acceptance of its claim to be regarded as indigenous, in spite of the puzzling features which this interpretation presents. It is to be hoped that further historical researches will throw more light on the question.

The return of the Goshawk to Britain was dramatically announced to the members of the British Ornithologists' Club in October 1950, by Col. R. Meinertzhagen.

He showed that three pairs bred during 1950 in a 15-mile circle (in an area which it has since come to be known was in southern England), and that young were also successfully hatched there in 1949. In addition, he had reliable information that Goshawks had certainly bred in the district for the twelve years preceding 1950. He himself had first seen a pair in 1938, but quite possibly they had nested there for many years, for in local cottages there had been two cases of stuffed birds, reputed to be well over 25 years old; one stuffed pair which he saw in 1928 were said to have been shot at the nest in 1921 (for full details see *Bull. B.O.C.*, vol. 70, pp. 46-47).

Regrettably, a few people—observers, photographers and keepers—directed their attentions to this area, and the position, as it is understood by the general body of ornithologists, is stated by D. A. Bannerman in Vol. V of *The Birds of the British Isles* (1956) where he writes: "There does not appear to have been any reliable evidence of nesting since 1951".

At this stage it is impossible to say whether the species had been re-established from escaped falconry birds or by immigration, but in view of the number of records that have occurred over the years, and which still accumulate, of birds on the East Coast, the possibility of natural re-establishment cannot be entirely ruled out; in East Anglia the bird has even been seen flying in from the sea.

In the meantime Goshawks have been reported during the past 5 years or so from a number of areas over the length and breadth of England and beyond, chiefly from east of a line from Dorset to the Wash; and from Ireland have come the first reports of Goshawks attributed to the European race. These occurrences, together with the bird's ability to nest virtually undetected for a number of years in southern England, make it seem possible that it is breeding elsewhere, and there have been unsubstantiated suggestions of this from widely separated localities.

Indeed, we are now indebted once more to Col. Meinertzhagen for the information that in 1956 he saw a Goshawk carrying food into a tree in circumstances which he considered indicated breeding, although the foliage made it impossible to see a nest.

P.A.D.H.



**Kite** (*Milvus milvus*)

By H. MORREY SALMON

THE BRITISH DISTRIBUTION of the Kite during the first four decades of the present century was summarized, as far as then known, in *The Handbook* (1939, vol. III, p. 86; also 1941, vol. V, p. 275). Fisher (1949) carried the record forward to 1948 and listed the numbers of breeding pairs believed to have nested, or to have attempted to nest, between the years 1938, the latest year quoted in *The Handbook*, and 1948.

Before proceeding further, however, it is desirable to look back for a moment at the statement in *The Handbook* that there were "only five birds known in 1905". This is, no doubt, taken from an account in *British Birds* in 1919 (vol. xii, pp. 214-215), which describes these five Kites as two pairs and one odd male, and which, in turn, can certainly be attributed to Meade-Waldo (1910) who stated that the total number of Kites surviving in Wales in 1905 was believed to be five, although he added that, in that year, the two pairs nested and reared four young, the first to be reared for ten years. Against this, however, in his contemporary account five years earlier Meade-Waldo (1905) quoted Professor J. H. Salter (*in litt.*) as reporting, in the spring of 1905, that there were three pairs and one or two odd birds; later, that there were three nests of which one had been robbed; and on 21st June 1905 that there were two nests, watched day and night, in each of which were two young nearly ready to fly. From the context it is clear that these Kites were in the central area which was then almost certainly the only Kite breeding-area known to both Salter and Meade-Waldo.

Nevertheless, although this clearly puts up the numbers of adult Kites in Wales in 1905, from *The Handbook* figure of five, to seven or eight, it still takes no account of additional Kites, of which there were certainly some, outside the central area. For instance, Forrest (1907) recorded a pair said to have been seen over the Dovey estuary in 1905, which is not improbable in view of past and subsequent occurrences of Kites in that area, but, of course, the possibility of two birds having wandered from the central area to the Dovey estuary cannot entirely be ruled out. Further, at the same time there had been rumours of Kites again in the south Breconshire area, of which Phillips (1899) and others had written, later amplified by Salter (1928) and, although there is no definite record that Kites were resident there in 1905, it is probable they were; certainly one pair nested there in 1906 and reared two young which were, unfortunately, shot later in the year.

It seems reasonably clear, therefore, that in 1905 there were seven or eight adult Kites in the central area known to Salter and, in addition, probably another pair in south Breconshire and even, possibly, yet another pair in north Cardiganshire; a minimum of nine and possibly up to twelve birds.

*Breeding.*

Fisher (1949) summarized the known position up to 1948. In that year, he recorded, there were probably six Kites' nests in Walcs, i.e. at least six breeding pairs, but it should not be inferred from this that the total was only twelve Kites. Subsequent information indicates that there were possibly other pairs then not located and perhaps unattached birds as well.

In 1949 it was at first believed that there might be seven breeding pairs but there was some disturbance in early spring and only four pairs were, at the time, known to have settled at nesting-sites; three of these were in the central area and one outside it. Four young were reared in two of these nests, but the other two failed. Subsequent information suggested that there was an additional nest in which a further two young were reared.

In 1950 the population in January was estimated to have been 24. Nine pairs were located in spring, of which seven were known to have nested, four pairs successfully, and eight young flew.

In 1951 eleven out of twelve known pairs nested or attempted to nest and, of these, seven pairs successfully reared ten young. In addition, various reports suggested the possibility that up to three other pairs might exist.

In 1952 the existence of fifteen pairs was again a possibility, but of these only eleven pairs were actually located. Nine of these pairs were known to have nested, but only five successfully, six young reaching the flying stage.

In 1953 fourteen pairs were definitely accounted for and, of these, six pairs successfully reared ten young. As well, there was a possibility that another pair might have been successful.

In 1954 at least fifteen adult pairs were known, together with possibly three more pairs and several apparently unattached birds. Twelve pairs were known to have nested; of these, ten were successful and reared fifteen young.

In 1955 Kites were adversely affected, as were other raptors, by the long-continued wet, cold weather and by the virtually complete disappearance of the Rabbit (*Oryctolagus cuniculus*), almost throughout their range, in the autumn of 1954, an event which must have detrimentally affected their food-supply. Only twelve pairs were located and, of these, ten pairs may have attempted to nest, but possibly in only four nests were eggs laid and only one young one flew.

In 1956 some pairs, on returning to breeding areas in spring, appeared unsettled; it may be that there had been abnormal winter-casualties and re-constituted pairs failed to settle down at nesting-sites and disappeared again. However, conjectural though that may be, only eight pairs were located and three young reared.

In recent years the majority of nests have been in oaks, but there have been a number in conifers, larch, spruce and Scots pine, two in beech, one in birch and one in ash. While several of the nesting-

sites still used have been occupied by pairs of Kites for very long periods, upwards of 50 or even 70 years, and alternative nests in the same wood are used in turn year after year, this is by no means always the case. Some pairs, possibly young birds, appear more fickle and may move two, three or more miles in successive seasons, but there is some evidence that fairly well-established pairs may have alternative sites up to four miles apart.

The fertility of the present stock of Kites in Wales does not appear to have been adversely affected by inbreeding; at any rate, of the twelve pairs which nested in the good season of 1954 two were prevented, probably by human agency, from breeding, leaving ten pairs which bred successfully and reared fifteen young birds.

While it is true that the known number of eggs in any nest in the period under review has only once exceeded two and has sometimes been one only, records are not complete, as climbing nesting-trees has been discouraged, but more often than not it is possible to overlook a nest from a higher vantage point. Certainly, in no case have more than two young hatched. Yet in the past, three eggs in a clutch were frequent, and often three young hatched and were reared.

Although 61 young Kites were seen to fly in the six years 1949-54, the known population at the end of the good 1954 breeding-season was *ca.* 55 compared with *ca.* 22 at the same time in 1949; an increase numerically of *ca.* 33 but indicating a mortality amongst the young birds (assuming no adult losses) of the order of 40%, without having had any unusually bad years during the period.\* How these casualties occur is uncertain; some may be from natural causes, but others are undoubtedly trapped or shot and the bodies buried or burnt. One was reported as found dead in the winter of 1952-53 and another was known to have been trapped about the same time, but in neither instance was the body produced; these are the only known casualties.

Coincident with the increase in numbers, distribution has extended, with the result that Kites have been seen regularly, and have possibly bred, in five counties.

#### *Wintering.*

It seems fairly clear that soon after the young are fledged there is a tendency to move away from the nesting-area and that normally by about August the parents and young separate. The numbers present from then on, until December, appear to be appreciably less than during the breeding-season, though the distribution is different. Some Kites, of course, winter in central Wales, but the inference must be drawn that some move right out of the area. In some cases pairs will take up their winter-quarters in successive years at the end of August, leaving early in the following March. In other cases a single bird may appear in October and remain until March or even early April. Winter-roosting may be in a

\* Any calculations of this nature are conjectural and should be treated with reserve.



wood of some size away from human habitations or, frequently in the case of single birds, close to a farm or even, in one case, in a yew-tree in a village churchyard. Woods may be deciduous or of evergreen conifers. There is no record of wintering in Britain outside Wales except one instance in Cheshire, where a Kite was reported as having appeared in mid-summer 1948 and remained until mid-winter 1948-49. Those Kites that winter in Wales cannot, of course, occupy winter-quarters very far from their nesting-sites; those that do so may move, possibly, only two or three miles and certainly not more than 20-30 miles. Some birds return to their breeding-woods at the end of December, others in February or early March, and then they often roost near the old nest.

### *Movements.*

While there is some apparent dispersal of individual birds to bordering English counties and to North Wales (once Eire, in Co. Meath, 15th November 1951), these are probably random movements of birds unsettled by disturbance or interruption of nesting in late April, May and June, and rarely winter; they are seldom sighted (i.e., identified and reported) more than once and such sightings have occurred within the period under review in Gloucestershire, Warwickshire, Staffordshire, Shropshire, Cheshire and North Wales. They average under one sighting a year. Other more distant records eastwards, in Northumberland, Nottinghamshire, Leicestershire, Buckingham, Essex, Surrey, Kent, Sussex, Hampshire, etc., seem much more likely to be related to movements of Continental Kites. Some appear to be quite impossible to relate to Welsh birds, e.g. two reported seen in Surrey, flying northwards, on 19 June 1954.

There is, however, reasonably conclusive evidence of a regular southward movement out of Britain in autumn and of a return movement in spring. Taking into account the relatively extremely small number of individual birds so migrating, certainly no more than a dozen in each year and probably nearer half that figure, the number of sightings reported in this direction, mainly in Somerset, Devon and Cornwall, must be regarded as proportionately quite high.

During the years 1940-56, out of 23 sightings reported in those counties (with one Wiltshire, one Hampshire, one Dorset and one Glamorgan), nine occurred in March (1)-April (8) and eight in August (6)-September (2). The remainder were November (1), December (2), January (1) and June (2). The preponderance of birds leaving in August and returning in April suggests that they are young birds departing after being left to their own devices by their parents and returning in the following spring at a time when the mature birds are well settled in their breeding quarters and already have eggs in their nests.

*Future prospects.*

Given reasonable freedom from interference the Welsh Kites can be expected to survive and to maintain themselves with the probability of a small, perhaps steady, increase. The major menace, at present, is the number of persons, interested or merely curious, who invade their breeding-quarters at the most critical times. Many of these argue that their visits are of such short duration as to be innocuous, but the successions of them that occur unsettle the birds to the point of desertion or allow natural enemies, e.g. Carrion Crows (*Corvus corone*) to take their eggs or small young. These persons include a certain number of egg-collectors. No less serious is the disturbance and interference caused by campers and caravanners and by the exploitation of the hill-tracks and by-roads by organised motor-cycle and car competitions, which may have exactly the same effect as stated above. Disturbance has also occurred through mechanized forestry- and farming-operations.

## SUMMARY

1. *The Handbook's* statement that in 1905 Kites in Wales were reduced to five birds is incorrect. The number was, at the minimum, probably nine and may possibly have been up to twelve.

2. The known population (including birds of the year) rose to ca. 55 at the end of the 1954 breeding-season, but after the bad year 1955 is now ca. 20, though it may be higher, due to loss of contact with unsettled pairs.

3. There is no evidence of loss of fertility due to inbreeding, though egg-clutches rarely now exceed two, as against three frequently 20-50 years ago.

4. While some birds winter in Wales, there is evidence of migration southward out of Britain in autumn and return in spring.

5. If Kites are to maintain themselves in Wales, they must have reasonable freedom from disturbance and interference in the breeding season.

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**Honey Buzzard** (*Pernis apivorus*)

THE position of the Honey Buzzard does not appear to have improved at all during or since the War, and it remains an extremely rare bird. We have been unable to establish that it is now more than an irregular breeder. Col. R. Meinertzhagen and

Major W. M. Congreve have told us independently, and each referring to a different area, that they think it quite possible that the Honey Buzzard nests annually, but the only evidence available for publication is of a bird of Col. Meinertzhagen's incubating in 1954 and a pair of Major Congreve's with young in 1947. Major Congreve, who is editor of the *Oologists' Record*, knows of no eggs being taken in recent years and it is not even certain that birds have been seen annually; however, the breeding Honey Buzzard is very unobtrusive, and it is easily overlooked or confused with the common Buzzard (*Buteo buteo*). The geographical scatter of the few definite breeding-records of which we have a note during the past 25 or 30 years is extremely wide. A remarkable record is of a pair in Fife in 1949 from April till 23rd July when one of the birds was shot; the pair was considered to be nesting.

Several casual or short-lived records in the breeding-season have appeared in local reports for the north-east English counties during the past 10 years. Elsewhere a bird was seen displaying in 1953, and in 1954 the behaviour of a pair in July and August suggested that it might have made an unsuccessful breeding attempt earlier in the season. Records of birds on passage are very few and irregular.

P.A.D.H.

### Marsh Harrier (*Circus aeruginosus*)

LIKE the Hen Harrier (*C. cyaneus*), the Marsh Harrier has made, during this century, a remarkable recovery from apparently imminent extinction. According to J. H. Gurney (*antea*, vol. xii, p. 243; and vol. xvii, p. 268), the number of Marsh Harrier broods reared in Norfolk declined from about 3 in *ca.* 1878 and 2 in *ca.* 1888 to none by *ca.* 1898. The level rose to 1 again by *ca.* 1908 and there was 1 brood reared in 1915, but in 1918 no nesting was even attempted in Norfolk, which was throughout this period the only British breeding-area of the species. Real recovery began in the 'twenties, and from 1927 to 1936 up to 4 pairs bred in Norfolk; during the ensuing two decades, numbers in the county have continued to fluctuate with a slight upward trend, and in 1954 a total of 5 breeding pairs successfully reared at least 15 young. During the 'thirties Marsh Harriers began to settle along the Suffolk coast, and probably started nesting there before the Second World War, since when they have continued breeding fairly regularly and in 1955 two pairs bred at Minsmere. Since the War also, nesting has been attempted in Wales and in southern England, and in one of these areas the breeding population at one time attained a level of half-a-dozen pairs, which had encouraging success in rearing young.

Although still probably even less numerous than the Kite the Marsh Harrier (aided by a superior rate of breeding-success, a



stronger migratory habit and a wider distribution) now appears to have a fair prospect of recovery under vigilant protection. Nesting pairs have probably trebled during the past two decades, and the total population, including non-breeders, has probably expanded even more, records of birds well away from known breeding-localities being increasingly frequent. It would not be surprising if further areas are colonized, and it is important that any indications of such attempts should be promptly notified to *British Birds* or to the Royal Society for the Protection of Birds.

Another recent development has been a tendency to winter in small numbers in various parts of England, to which it was considered only a summer-visitor up to the time when *The Handbook* was written.

In Ireland, where, until about 1840, it used to be a widely-distributed nesting-bird, it remains a rare vagrant, as it is also in Scotland. E.M.N.

### **Hen Harrier** (*Circus cyaneus*)

By JAMES W. CAMPBELL

THE PAST HISTORY of the Hen Harrier in Scotland is a dismal story of rapid decline, during the 19th century, almost to complete extinction due to intense persecution. Just over 100 years ago, William MacGillivray writing in 1840 described it as nowhere very common but generally dispersed in Scotland, and in some districts pretty numerous in the breeding-season, retiring to the hill-tracts and moors for nesting. Throughout the rest of the 19th century its decline as a breeding species was rapid, owing chiefly to persecution from game-preservers, although land-reclamation and the draining of old breeding-grounds, in the interests of agriculture, played some part. By the end of the century it seems certain that the Hen Harrier had ceased to breed on the Scottish mainland, and did so regularly only in Orkney and the Outer Hebrides.

From 1900 until 1939 there was little change in this position: Witherby's *Practical Handbook* of 1924 stated "as a breeder now practically confined to Orkneys, Outer Hebrides . . .", and *The Handbook* in 1939 could only add "attempted to nest Perthshire 1922, probably bred about 1925 on borders of Cumberland and Dumfries, bred Inverness 1936". Some twenty-five years of personal observation, during the latter part of this period in the Highlands, failed to produce any evidence suggesting that this was not a fair estimate of conditions even for the remotest areas.

The conservation of the remnant breeding in the Islands, however fortuitous it may have been initially, has been of considerable importance for the future of the species in Scotland. Having become rarities, the island populations of Hen Harriers inevitably attracted the egg-collectors, and throughout the 1900-1939 period the menace was from them, not from the game-keepers.

In Orkney, the local population was rescued and brought to its present satisfactory state through the efforts of the late George Arthur, a fine example of the part that individual initiative can play in conservation. The Outer Hebridean harriers survived on well-kept ground, which at first sight may seem surprising in view of the treatment received from game-keepers on the mainland; but in the Southern Outer Isles, which is the harrier ground, keepers have been engaged mainly in wildfowl conservation, and have not been concerned with the problem of maintaining large grouse stocks. In spite of increasing difficulties from the impact of civilization, a breeding stock was maintained, and the present trend is towards an increase.

It is now fairly widely known (and various references to it have already been published) that, since 1939, Hen Harriers have been breeding once more on the Scottish mainland. Unfortunately, definite dates of first breeding are as elusive as last dates of breeding were during its decline. Keepers, stalkers and bird-watchers were no longer active on the hill during the War years, and, since the War, the realization that there is a definite move towards giving rare raptors a "new deal" has in some cases made the extraction of past histories difficult, and much information has "gone underground" for good. Notwithstanding this reluctance to divulge facts, the vast acreages involved and other difficulties, a considerable amount of data has been collected about this welcome change in status. I wish to acknowledge my thanks to the observers who have supplied information, and in particular to Messrs. P. W. Sandeman and George Waterston.

(a) *Central Highlands*.—The first definite record of breeding since 1939, in the Central Highlands, is a personal one—the finding of two nests within half a mile of each other in 1946. Inquiry and subsequent field-work showed that these two nests were not isolated cases, and suggest that breeding must have taken place before 1946 in this district, where Hen Harriers were quite unknown up to 1939. Since 1946, breeding in the Central Highlands has been attempted annually, and nests have been found within a comparatively narrow belt, some 30-40 miles in extent. This area comprises some first-class grouse-moors, once again well-kept and making high rents, so that every effort is made to improve grouse stocks. Hen Harriers are, therefore unwelcome but, in spite of persecution, there have been a very few successful cases of breeding each year, and young have been fledged. Hen Harriers, however, during the last three years are seen less frequently, and are scarcer than they were in the immediate post-war years.

(b) *South-west Foothills*.—In the last few years, breeding has taken place to the south-west of the above area, and there have been successful fledgings where game-preservation is less intense.

(c) *South-west Highlands*.—Successful breeding has recently been reported.

(d) *North-east Highlands*.—Hen Harriers have been seen regularly in the breeding-season during the last five years. In spite of persecution, successful breeding has been reported.

(e) *North Highlands*.—North of the Caledonian Canal, in the north coast area, where intermittent breeding may probably have occurred before 1939, a few pairs now breed regularly; and, since 1949, nesting has taken place in another district, where the position is stated to be precarious due to collectors and keepers.

There are thus some six areas on the Scottish mainland, where since 1939 it is known that Hen Harriers are attempting to become established; it is possible that breeding, so far undetected, is taking place elsewhere. The cessation of game-preserving during the war years, 1939-1945, was undoubtedly of importance for this recolonization, and "gave the harriers a chance". That they did not benefit during the similar respite in the 1914-1918 war years was probably because of the precarious state of the island-stock at that time, but since then, through active conservation, particularly in Orkney, a surplus had become available. Hen Harriers have shown a tendency to breed in groups, and some tenacity in returning annually to favourite nesting-localities. Much more information is needed concerning their diet, but the distribution and population-density of small mammals and Passerines (moorland breeders), and waders, seem to be important factors influencing the selection of breeding-areas. For example, in the Outer Hebrides Hen Harriers breed south of the Sound of Harris, where voles occur and there is a high density and concentration of small Passerines and waders, but the species is unknown as a nesting-bird in Lewis and Harris, where there are no voles and the small Passerine and wader populations are very small and scattered.

Evidence is needed of the extent and effects of the predation by Hen Harriers on stocks of Red Grouse (*Lagopus scoticus*); grouse populations were very low in some instances, when first efforts were made at breeding in grouse-moor habitat, which certainly suggests that its selection was not directly related to the presence of grouse.

There is a preference for tall, rank, old heather for the actual site of the nest; the War disorganized the normal rotation of heather-burning on grouse-moors, and provided an abundance of suitable nest-cover in districts where none had been available for years.

It is clear that the persecution which harriers have received since game-preserving restarted after the War, has interrupted their recolonization very considerably; many adults and nests have been destroyed on the breeding-grounds, and others succumb to gun and trap during their autumn and winter wanderings. Breeding-successes on grouse-moors have been achieved through the co-operation of landowners and their keepers, the action of private individuals, and the reward-scheme of the Royal Society for the



Protection of Birds. Much good work has already been done by the Nature Conservancy and the Royal Society for the Protection of Birds in enlisting co-operation from those engaged in game-preserving, for adequate protection is essential. The Hen Harrier is included in Schedule 1 of the Protection of Birds Act (1954) and therefore receives protection under special penalties. This is not the place for a discussion of the best methods to be adopted in obtaining effective protection for rare raptors, but, besides security from actual destruction, freedom from disturbance during the nesting-season is of high priority. It is to be hoped, therefore, that bird-watchers who wish to see Hen Harriers on their breeding-grounds or to photograph them at their nests, will use the utmost discretion in avoiding an embarrassment to a rare bird, which would certainly succeed in its attempt to extend its range, if it were only left alone.

The Hen Harrier's status in England, where it is a regular winter-visitor in small numbers, has not altered appreciably in recent years. With regard to Ireland, however, it has now come to light (*Irish Bird Report*, 1955) that breeding has evidently taken place in one locality over the past 30 years, and the bird nested successfully in at least two counties in 1955; further it is understood that in 1956 breeding took place in at least three counties.

[On page 166 there appears a note on the Hen Harrier as a breeding bird in Norway, kindly prepared for us by Dr. Yngvar Hagen. It seems that the re-establishment of the species in central Norway occurred 15 or 20 years earlier than on the Scottish mainland, but that the return to breed in the Highlands may have coincided with, or immediately followed, peak numbers in Norway. —Eds.]

### Montagu's Harrier (*Circus pygargus*)

MONTAGU'S HARRIER never came so near to extinction in England and Wales as the Hen and Marsh Harriers (*C. cyaneus* and *aeruginosus*), but numbers early in the twentieth century were at a very low ebb. J. H. Gurney (*antea*, vol. xii, p. 243) estimated the decline in broods raised in Norfolk as being from about 6 in *ca.* 1878 and 4 in *ca.* 1898 to 3 by *ca.* 1908 and 3 in 1918. In 1923 5 broods were known to have been reared in the Broads area, and in 1924 Norfolk as a whole reared at least 8 or 9. In 1939, despite this species having had a setback during 1935-36, *The Handbook* could still rank Norfolk as the only county in which nesting was regular, but recent experience here has been less satisfactory. In 1954, for example, 3 pairs reared in all only 4 young in the Broads area, and there were no certain breeding-records elsewhere in the county, which no longer contributed more than a small fraction of the annual production of juveniles, for the whole country.

There have been fairly frequent, although not annual, breeding successes in Suffolk, and nesting was unsuccessfully attempted in Lincolnshire in 1951. In Yorkshire there were only two breeding-records between 1880 and 1935, since when one or two pairs have bred fairly frequently. In 1947 breeding occurred north of the Tees for the first time since 1835 and three pairs bred in Co. Durham in 1953, while attempts at breeding were made in Northumberland in 1952 and in south-west Scotland in 1953.

In North Wales breeding was interrupted between 1877 and 1945, but since then the species has regained its foothold: 3 pairs bred in 1949 and the most recent information we have is that three pairs attempted to nest at the main locality (two being successful) in 1956. In South Wales one or two pairs breed fairly regularly.

The main strength of the species is, however, in southern England from the New Forest westwards, and the total British breeding population is probably of the order of some 40-50 pairs. There has certainly been an increase in some areas, notably in the south-west during the war, but it is difficult to be sure whether there has been any real change in the national total since the publication of *The Handbook*, as the data are too incomplete.

Montagu's Harriers are rarely seen in the British Isles outside the breeding-areas, where they normally occur only during the spring and summer months. They are very rare in Ireland, and also in Scotland although given improved protection they may seek to breed in the Lowlands. E.M.N.

### Osprey (*Pandion haliaëtus*)

By P. W. SANDEMAN

FOR MANY YEARS it was thought that the last breeding of the Osprey in Scotland was at Loch Arkaig in 1902. It was only as recently as 1943 that Cameron of Lochiel wrote to *British Birds* correcting the date to 1908, and this has been widely accepted as the last definite nest. Lochiel, however, added that since 1913 (when the last survivor of the Loch Arkaig eyrie ceased to return to the site) he had seen an occasional passing bird "which I took to be one of the birds that I understood were nesting on Loch Loyne on the Glen Garry Estate, where the late Captain Ellice told me a pair of Ospreys continued to nest for some time after our pair had left me". Whilst there is no definite confirmation of this, when the writer was staying with Mr. Cameron, Stalker of Lochiel Estates, in June 1933, he was informed that a pair had bred on an island of Loch Loyne as late as 1916. This island will disappear beneath the waters as the level of the loch is raised by hydro-electric activities.

In the early 1920's some Ospreys were released and reared with protective supervision on the Aberdeen/Banff border; juveniles were seen in this area in 1925, and there was an unconfirmed

report of nesting in 1926. We know of no evidence of breeding in Scotland during the next 25 years, although there were intermittent records of passage birds at such places as Isle of May, and various border and central Highland lochs and straths. Very rarely have they been seen on the west coast or at west Highland lochs, but one or two have occurred regularly in Orkney and Shetland.

With the 1950's came an increase in reports from Scotland: in 1951, 1952 and 1953 six Ospreys were reported each year between mid-May and mid-June, but two were shot or trapped in 1951 and two more in 1952, and one each in 1953 and 1954.

However, in 1954 several birds were seen until the end of June at two Highland lochs outside Speyside, and in 1955 an eyrie was completed on Speyside rather late in the season but no eggs laid. Another nest was found early the following year, which is presumed to be the first nest built in 1955, the birds having built a second nest after being frustrated at the first. In 1956 a pair returned and built a new eyrie in the forest, well away from water. At this nest, of a rare and timid bird struggling to re-establish itself, a microphone was fixed up, for broadcasting the cries of the parents anxious to return. After this, the eggs disappeared, perhaps taken by Hooded Crows (*Corvus cornix*). Later in 1956 another nest was built a few miles away, which points to the same pattern having occurred in 1955. After this nest was finished, no eggs having been laid, the pair dispersed early in August. Other details of this disgraceful episode are given in *Bird Notes*, vol. 27, pp. 130-131. The bird deserts readily and we would appeal to all our readers, however well-intentioned, not to attempt to see Ospreys, and in particular their eyries, let alone disturb them in any way, until mid-July when the young should be part-grown. Hooded Crows are particularly troublesome in this area and even a brief and unintentional disturbance of a brooding bird could lead to the loss of the clutch without the person responsible knowing the damage he had inflicted.

In England, an incomplete analysis of local reports shows that post-war records have averaged 20-30 per year, with no indication of any increase during this period. Occasional birds are probably shot most years. There is more than one record for every month of the year except December, which suggests an unexpectedly strong tendency to winter—in this respect similar to Marsh Harrier (*Circus aeruginosus*). Birds have also occasionally stayed for a month or two in spring, summer or autumn. Over the country as a whole, they are more often seen in spring than autumn, May having more than double the number of records of any other month, and equalling August, September and October combined. On the south coast, however, autumn records exceed those of spring. The bird is rare in Wales, and a rare vagrant in Ireland, but is regular on passage in south-west England



(Cornwall, Devon, Somerset and Dorset), occurring more or less annually in each county.

The present encouraging signs of return as a breeding species to Scotland occur at a time when the bird has been recovering some lost ground in Scandinavia also (*antea*, vol. xlix, p. 490).

### **Hobby** (*Falco subbuteo*)

By P. E. BROWN

Of all the British birds of prey, the Hobby is probably the most elusive and it is therefore difficult to define its status with any certainty. It breeds in strength only in Hampshire, Sussex, Dorset and Wiltshire; and in each of these counties in some years there may be up to, or even a little over, ten breeding pairs, but the grand total for the whole four counties would be unlikely to be above 50. Surrey and Berkshire might each provide a further 5-10 breeding pairs; and Oxfordshire and Gloucestershire are unlikely to have more than 5 each. One or two pairs breed regularly in each of Kent, Buckinghamshire, Herefordshire and Shropshire. Pairs have also bred in Middlesex, Somerset, Devon, Warwickshire, Worcestershire and Northamptonshire, but there seems no certainty that they are regular and it is possible that the species breeds sporadically in Essex, Suffolk, and Cambridgeshire, and perhaps also in Norfolk. The number of breeding pairs in any one season in Great Britain may well fall between 60 and 90 pairs, but it is impossible to be precise in the case of a bird which is often hard to locate and which, even after breeding successfully, may not occupy the same site in the next season.

The species has bred as far north as Cheshire and Yorkshire, and it has also bred in Wales, though we know of no recent records. There is little substantial change in the status of the species over the last fifty years.

Outside the breeding-areas Hobbies do not occur over as wide an area as might be expected from a bird of prey, but they occur from time to time as far west as the Scillies and there is a record from Ireland as recently as 1953.

In preparing this note I acknowledge my indebtedness to a number of correspondents and especially to Mr. P. A. D. Hollom.

### **Peregrine** (*Falco peregrinus*)

By I. J. FERGUSON-LEES

BETWEEN 1947 and 1950 I attempted, through correspondence with a large number of ornithologists, gamekeepers, falconers and so on, to make as complete as possible a census of the breeding population of the Peregrine in Britain and Ireland. A summary

of the results of that census appeared in the journal of the Royal Society for the Protection of Birds, in two parts, in the spring and autumn of 1951 (*Bird Notes*, vol. xxiv, pp. 200-205 and 309-314). Since then no further real study has been made of the status and distribution of this species, so that the account which follows here is inevitably somewhat out of date. There was the possibility of revising the figures according to information given in the recent literature, particularly the county bird reports, and in letters received during the last year from some of my earlier correspondents. However, it quickly became clear that data gleaned from these sources were too scrappy to be of any value except as indicators of general trends. In the case of the county reports, which should theoretically supply an almost complete index for England, this scrappiness is due to the fact that a number of them do not publish any Peregrine figures at all, either through cautiousness or because the information has not been given to them. But while it would obviously be very unwise to publish details which might give away the actual location of any eyries, it seems unlikely that area totals in these reports would do any harm, for the outline distribution of the Peregrine is already well enough known, and those most likely to rob the nests are probably as familiar with the sites as the keenest bird-watcher in any county.

As a result of the shortage of recent data, it has therefore been thought best, for the present series on birds of prey, to repeat the more important parts of the information that was published in 1951, and I am grateful to Miss M. G. Davies, Editor of *Bird Notes*, for permission to use extracts verbatim from my original paper. Where recent observations have indicated change, this has been mentioned, but in fact the picture as a whole suggests little alteration over the last seven years; and I think therefore that the census figures still provide a fair summary of the Peregrine's distribution in these islands.

Before any discussion of Peregrine numbers it is necessary to consider the events of the last War which, probably more than any other single factor in recent times, affected the status of this species. Between 1939 and 1945 the Air Ministry organized in most areas the wholesale destruction of the Peregrine in an attempt to safe-guard the official carrier-pigeons (*Columba* sp.)—because pigeons, both trained and feral, are among the chief victims of the bird. As far as it was possible to ascertain any figures, something under 600 adults and immatures were shot during this period, in addition to many eyasses and eggs being destroyed. The greatest slaughter was probably on the South Coast of England. It is deplorable that this destruction of one of our finest and less common breeding-species had to be ordered and in some areas the numbers have still not recovered, but it meant that it was important to obtain comparative figures of the pre-War population.

The area of Great Britain and Ireland (less the Channel Is.) is some 120,800 square miles; in this area it was possible to plot the





Eric Hosking

PHOTOGRAPHING THE KITE (*Milvus milvus*): COTO DONANA, SPAIN, MAY 1956

On the left is shown the pylon structure from which these photographs were taken, with the nest—11 feet away and 34 feet above ground—clearly visible to the right, in the cork oak. It was typically sited in one of the main forks of the tree. The right-hand photograph shows the female calling as the male flies overhead: at times the adults were quite noisy and excited duets took place (see pages 155-159).







Eric Hosking

PAIR OF KITES (*Milvus milvus*) AT THE NEST: COTO DONANA, SPAIN, 20TH MAY 1956  
This gives one a good impression of the adults' slender build and the well-marked pattern of their plumage. Normally 2-3 eggs are laid and in this nest there were two young, by this date about 30-33 days old, the feathers showing plainly through the down (cf. plate 31). The nest was the usual flattish structure of sticks and earth, lined with grass and rubbish (see page 158).



Eric Hosking

FEMALE KITE (*Milvus milvus*) AT THE NEST: COTO DONANA, SPAIN, 20TH MAY 1956  
An unusual head-on view illustrating the yellow eyes, and the binocular vision of which the Falconidae are much more capable than most birds. The head, though streaked, is lighter than the rest of the body and here the male's was grey, the female's lemon-yellow. The female spent much time with the young, sometimes arriving without food, particularly in the middle of the day when they were often drowsy and apparently not hungry.





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FEMALE KITE (*Milvus milvus*) SNATCHING FOOD FROM MALE



Eric Hosking

FEMALE KITE (*Milvus milvus*) FEEDING YOUNG

COTO DONANA, SPAIN, MAY 1956

The male seldom stayed long at the nest, usually depositing the food and leaving at once, though occasionally he fed the young himself. If the female was at the nest (*upper*), she would snatch the food from him, almost without waiting for him to settle, and it is interesting to compare this rough action with the tender way in which the female feeds the young (*lower*) (see page 150).





Eric Hosking

FEMALE KITE (*Milvus milvus*) TEARING PREY



Eric Hosking

YOUNG KITE (*Milvus milvus*) EXERCISING WINGS

COTO DONANA, SPAIN, MAY 1956

The upper illustrates the raptor's typical method of tearing its prey: with one foot on the food it pulls upward until the piece it is holding in its beak breaks off. Rabbit (*Oryctolagus cuniculus*) was the commonest prey and the piece shown seems to have great elastic possibilities. In the lower the female looks on as the elder youngster—as is usual, there were 2-3 days between them—exercises its wings, an ever-increasing occupation as they grow older.



*Eric Hosking*

FEMALE KITE (*Milvus milvus*) STRETCHING WING

COTO DONANA, SPAIN, 20TH MAY 1956

This gives a good indication of the shape and size of the white patch on the underside of the primaries; it is clearly visible in flight at any reasonable range. Here, too, can be appreciated the strong streaking on the rufous under-parts. The wing-patches and the lighter plumage are both useful distinctions from the Black Kite (*M. migrans*), but it is the forked tail of the present species which particularly stands out.





Eric Hosking

FEMALE KITE (*Milvus milvus*) AT NEST  
COTO DONANA, SPAIN, 15TH MAY 1956

An unusually fine shot showing the pattern of the upper-parts, the contrasting light head, and the tail-fork, the base of which is partly concealed by the tips of the folded wings. The upper-parts are much less uniform than those of the Black Kite (*M. migrans*), the reddish-brown feathers being bordered by pale edges. When this was taken, the young were only 25-28 days old and still almost completely covered in white down (cf. plate 30).





Eric Hosking

FEMALE KITE (*Milvus milvus*) PREENING



Eric Hosking

FEMALE KITE (*Milvus milvus*) LEAVING NEST

COTO DONANA, SPAIN, MAY 1956

The upper is a remarkable view of the spread tail, showing its almost uniform chestnut colour (barred and tipped with black only on the outermost feathers), as the bird preens. Even when spread, the Kite's tail retains its fork, while that of the Black Kite (*M. migrans*) becomes a straight-ended triangle (see page 157). In the lower, one gets a good impression of the half-feathered tarsi and yellow feet as the bird raises its wings to plunge off the nest.

location of between 570 and 586 Peregrine breeding-sites, of which between 480 and 500 were occupied in the three years 1947-49. (The margin of uncertainty, which was eliminated as far as possible, was caused by conflicting or possibly duplicating reports from different observers.) In addition, it was estimated in 1951 that there were probably not less than 100 and not more than 200 further pairs—figures which were suggested by the samples from certain parts of Scotland and Ireland where the lack of observers made the census far from complete. The criticism has been put forward that these estimates for the further pairs were probably below the true figure; that there are many stacks and small islands in the remoter parts of Scotland and Ireland, holding single pairs of Peregrines which it is impossible to calculate. That may be so, though personal experience and the observations of others suggest that it is likely that the number of Peregrine-occupied stacks off, for example, the west Scottish coast is not as large as might be imagined. But, allowing for the possibility that the total of missed birds was under-estimated, we believe that the present Peregrine population of Britain and Ireland may be fairly put at between 650 and 750 breeding pairs, a total that is probably still 100-200 pairs below the pre-War level—perhaps not surprising if one thinks of the War-time campaign as having accounted for 300 "pairs".

In England, in 1948 and 1949, between 72 and 78 pairs of Peregrines bred or attempted to breed, and in the same area in 1939 and 1940 there were 123 known (recently used) breeding-cliffs, of which probably not more than 115 were occupied in any one year—from which figures it can be seen that the 1949 Peregrines in England numbered only about 65 per cent of the pre-War maximum. In 1944, although figures for that year were more difficult to obtain, there were approximately 55 pairs or about 48 per cent of the 1939 total. So that, although the species was considerably reduced under the War-time control, when the official destruction ceased there was in most cases a remarkable increase in the number of breeding pairs (36 per cent over the end-War low level). On this basis, one might have expected the population to have regained its pre-War strength by now, but that does not seem to be the case, and a fair estimate of the present population would be 85, just possibly 90, pairs. To give one example of a county which is still below par, Sussex before the War had 8-12 pairs in 16 miles of cliff, with sometimes three cyries in the space of a mile (J. Walpole-Bond, *A History of Sussex Birds*, p. 237)—figures which must indicate almost the maximum possible density—but in 1954 (*Sussex Bird Report*, 1954, p. 10) only 5-6 pairs were recorded. In the south of England the Peregrine breeds in Kent, Sussex and the Isle of Wight westwards to Dorset, Somerset, Devon and Cornwall, mostly on sea-cliffs. It has also bred during the present century in Hampshire, Gloucestershire and Shropshire; and annually in Monmouthshire. In the



north, most pairs are inland in Westmorland and Cumberland and also in Northumberland, Lancashire, Yorkshire and Derbyshire, while it has nested in Durham. The species also breeds in the Isle of Man. In concluding this section, some mention must be made of Salisbury Cathedral (Wiltshire), which has often been referred to as a past breeding-site of the Peregrine. However, intensive enquiries some years ago, both by myself and by Major W. M. Congreve, suggested that most of the alleged records could be attributed to the nests of Kestrels (*F. tinnunculus*) being found at times when one or more Peregrines, possibly falconers' birds, had been seen flying over the city or occasionally perching on the spire. One clutch of eggs, thought to have come from the Cathedral, was found to be labelled with a locality in Ireland! In fact, I know of only one well-authenticated case of Peregrines nesting on the Cathedral: this was in 1896 when two young birds were taken from the cyrie by a Mr. White and sent to Col. R. Meinertzhagen and Mr. Gerald Lascelles (R. Meinertzhagen, *in litt.*).

In Wales before the War there were 108 regularly used sites, and of these 78-85 were in use, or probably in use, in the years 1947-49; in addition, three completely new sites were reported. Probably neither of these totals is quite complete. It appeared then, in 1949, that the post-War population stood at about 78 per cent of the pre-War figure. Recent data are too meagre to warrant any comparisons, but I have had details of 4 new sites in the past two years (2 of these may have been previously overlooked, or not reported to me). In Wales the Peregrine breeds regularly in all counties, including Anglesey and several smaller islands, although there is some doubt about the present status of the species in Flint.

In Scotland the position is far less certain and, although the distribution is well understood, it is probable that the 151 pairs reported in 1949 represent no more than half of the total, perhaps no more than a third. This is partly due to the shortage of observers in the wilder districts, but more particularly to the number of cyries which are to be found on small islands and inaccessible stack-rocks off the coast. The Peregrine breeds in every county in Scotland except Kinross (where it used to nest), Renfrew, Lanark and Roxburgh, although it nests only sporadically in Midlothian and there are doubts about its status in West Lothian. It also nests in Orkney, Shetland and in the Inner and Outer Hebrides. The 1939-45 War apparently had less effect on Peregrines in Scotland than in England and Wales, and the sample total of 1948-49 was nearly as great as the 1939 figure (about 160 for the same areas), although a large number of Peregrines were shot under Air Ministry orders. Recent figures are again rather scanty, but suggest that in some inland areas the numbers are lower than they were in 1948-49, due to persistent persecution by keepers. A sample of inland areas which between



them held 31-34 pairs in 1948-49, held probably no more than 20-22 pairs in 1954. Peregrines can survive a remarkable amount of nest-destruction without any apparent drop in numbers, but determined shooting of the adults soon has a marked effect on the population—obviously. The Peregrine is rigidly protected under the Protection of Birds Act 1954 and, as with the other less common birds of prey, it is important that we should make sure that this protection is made effective.

In Ireland as a whole the numbers were negligibly affected by the War, largely because most of the country did not come under the Air Ministry order. In Northern Ireland, in 1948-49, there were certainly 25 pairs, possibly as many as 28, of which half were in Co. Antrim, and the species breeds in each county with the probable exception of Co. Armagh, while the exact position in Co. Fermanagh is uncertain. This 1948-49 figure was almost exactly the same as that of the pre-war population, in spite of the fact that Peregrines were destroyed in *Northern* Ireland during the War. A speedy recovery from the War-time campaign was thus indicated, and supported by the figures from one stretch of the Co. Antrim coast where, at the end of the War, the total was reduced to 4 pairs, but where by 1949 the pre-War level of 9-10 pairs had again been reached. Recent reports, however, suggest a decrease in Co. Antrim, and possibly in one or two other parts of Northern Ireland as well. In Eire 163 pairs were reported to me and the general impression was of no significant change in status between 1939 and 1949. Recently, however, casual reports suggest that the species may be slightly on the increase. In Eire the Peregrine breeds in Cork, Kerry, Sligo and Donegal, Mayo, Galway, Clare and Tipperary (but not now apparently in Limerick), Waterford, Wexford, Wicklow and Dublin—also Cavan. In addition, it has bred in Limerick and probably breeds in Leix, possibly in Carlow and Kilkenny. It can be seen that the counties forming the central plain are almost or entirely devoid of breeding Peregrines.

Table I shows how much greater is the coast population of Peregrines than the inland one. The pre-war figures for England and Wales have been used, since the 1948-49 figures reflect a higher coastal mortality under the Air Ministry order, and so show an erroneously low percentage of coastal pairs—England 64.0 per cent, Wales 64.2 per cent. The figures in brackets are the actual numbers of eyries known in the 1939 period (England and Wales) or the 1949 period (Scotland and Ireland). It will be noticed how little the various percentages differ from those of the total. It is a possible source of error that Peregrines are more easily missed inland than on the more limited coast-line and that therefore the coast percentage is just so much exaggerated. However, many areas were particularly well covered and supported the proportions given.

TABLE I—PERCENTAGES OF EYRIES OF PEREGRINES (*Falco peregrinus*) ON THE COAST AND INLAND, IN BRITAIN AND IRELAND

	Wales	Ireland	England	Scotland	Total
Coast	67.6 (73)	72.4 (137)	72.5 (89)	70.9 (107)	71.2 (406)
Inland	32.4 (35)	27.6 (51)	27.5 (34)	29.1 (44)	28.8 (164)

The figures in brackets are the actual numbers of eyries known.

It has often been stated that the Peregrine is now absent from many former breeding-sites, but there is not such a very great wealth of evidence in support of this. Of 49 eyries noted in the falconry and other literature of the 16th to 19th centuries, 42 were still in use between 1930 and 1939; apart from these, there are only 57 cliffs known to the writer which once regularly held Peregrines and which became deserted before 1939. Compare this with the total of 570-odd occupied eyries known at that time. These calculations do not take into account eyries which have been used only once or twice and then not again, or eyries which have been temporarily occupied for only one or two seasons, as these are only annual fluctuations.

It is a characteristic of a number of species of birds to show considerable tenacity in holding to their breeding-haunts, but it is a particularly well-marked trait of several of the Falconidae, and perhaps above all of the Peregrine. Generations will use the same favoured place in which to nest and, sometimes, certain long-chosen areas will be filled year after year, even when the adults and young of the previous year have all been killed. At one Scottish eyrie the keeper admitted that he had shot both adult Peregrines in 13 years out of 23 and that he had killed the female alone in 5 more, while he had always destroyed the young or eggs—and yet the cliff continued to be occupied. This was of course an exceptional case of a particularly favoured site, but it became deserted after 1937 (but was again reoccupied after the War). Such an example does not, however, suggest that no harm is done by the destruction of these birds—on the contrary, the increase of the species is being hindered by the necessary filling of gaps in the already existing population.

Where a fair measure of breeding-success is achieved, the same nesting-cliff may be used by successive Peregrines almost *ad infinitum*. There are at least 70 eyries which, with their alternative sites in the same cliff, have been occupied almost continually for over 30 years, according to first-hand information; another 27 are known to have been used for more than 40 years, several for some 50 years, and at least two for nearly 70 years of continuous use. Through the literature, several sites can be traced back for over 100 or even 200 years, but, much more remarkable, there are at least three island sites aged more than 350 years, this being known because the young Peregrines from them were much celebrated for their use in falconry. The earliest mention of the oldest of these, one in the Isle of Wight, is 1564, and the same cliff has housed falcons in several seasons since the War.

The paper in *Bird Notes* (*loc. cit.*) considered some of the factors which may perhaps have a bearing on the distribution of the Peregrine in Britain, but there is not space to repeat them here, nor would they be entirely relevant to the object of this series on birds of prey. But it should just be added that, as with the Golden Eagle (*Aquila chrysaëtos*), Man is undoubtedly this bird's greatest, and in Britain almost its only, vertebrate enemy. In the shape of pigeon-fancier, game-keeper and farmer, falconer and egg-collector, he is a factor of considerable importance to the survival of the species. And, if we are not to see one of our finest, fastest and fiercest birds become rarer than it is at the moment, then we must safe-guard its future and encourage a more benevolent attitude towards it. It must be stated in all fairness that the consequences of the work of egg-collectors, however reprehensible this may be, have been greatly exaggerated and this is perhaps well shown by the good position in 1939 of the oft-robbed Peregrine population of the South Coast. This should not be taken to imply that egg-collecting has no effect whatsoever, for it must be a contributory factor to any decline of the Peregrine, but it is added simply to emphasize that it is the shooting of the adult birds which does the greatest damage.

In conclusion, I would like to thank once again the large number of people who have, over the last ten years, helped me by providing data on the breeding-sites of Peregrines and who are far too numerous to begin to mention individually. I will be very glad to hear from anyone who can give me any help towards completing an up-to-date census of this species and no details of the location of any site will be revealed.

## PHOTOGRAPHIC STUDIES OF SOME LESS FAMILIAR BIRDS

### LXXX. KITE

Photographed by ERIC HOSKING

(Plates 25-32)

Text by I. J. FERGUSON-LEES

THE KITE or Red Kite (*Milvus milvus*) has a much more restricted range than its close relative, the Black Kite (*M. migrans*), of which we published photographs just a year ago (*antea*, vol. xlix, plates 5-7, pp. 140-141). It is usually, too, a much scarcer species. Though breeding through much of the Continent of Europe—except N. W. France, the Low Countries, Scandinavia (where it nests only in S. Sweden), N. Russia and the southern part of the Balkan Peninsula—it is otherwise found only in Turkey and east to Persia and the Caspian, in N.W. Africa, the Canaries and the



Cape Verde Islands. The birds in the last area are of a very distinctive race (*M. m. fasciicauda*) which is darker and less red, with a shorter and—as its scientific name implies—strongly barred tail (*cf.* plate 32, upper): thus its appearance is somewhat intermediate between the typical form and the Black Kite. The Red Kite, too, is less migratory than the Black, though in winter the European birds tend to concentrate in the Mediterranean region where quite large flocks, even up to several hundreds, may then gather together to roost; it is, however, not really a gregarious bird, in the way that the Black Kite often is.

Elsewhere in this issue (pp. 137-141) there appears a summary, by Col. H. Morrey Salmon, of the Kite's present status in Britain; thus Mr. Hosking's remarkable and varied series of photographs forms a particularly fitting accompaniment. They were taken, not of course in this country where it would be an act of criminal folly to risk disturbing one of the few pairs, but in the Coto Doñana of southern Spain in May 1956, during an expedition of which the writer was also a member. There the Kite is a common bird—though not as common as the Black Kite which outnumbers it by perhaps 20 to 1—and because it was one of the very few British-breeding species which had not been really satisfactorily photographed somewhere, it was one of our main objectives and it was with the greatest possible interest that we set about the task.

Although the Kite is now one of Britain's rarest breeding raptors, this was not always the case and there is clear evidence that it was at one time widespread in England, Scotland and Wales; and just possibly Ireland, too, though there is little to indicate this, and Kennedy, Ruttledge and Seroope (*Birds of Ireland*, 1954, p. 106) are able to cite only two certain records, from Wicklow and Meath. It is even generally accepted that it swarmed in London until at least the end of the sixteenth century. R. S. R. Fitter (*London's Natural History*, 1945, pp. 51-52, 86-87) writes: "In the fifteenth century several writers refer to the large number of kites in London . . . . Schasehek noted in his diary that nowhere had he ever seen so many kites as on London Bridge. The . . . . secretary to the Venetian ambassador . . . . noted in his journal . . . . : ' . . . . It is the same with the kites, which are so tame, that they often take out of the hands of little children, the bread smeared with butter . . . . given to them by their mothers'". Shakespeare makes several references to the kites, describing London as "a city of crows and kites".

There is no question that the Red Kite bred widely in the British countryside, but were these London birds *Milvus milvus*? Or could they have been Black Kites? The Black Kite is now known only as a rare vagrant to these islands, but it is common in much of the Old World except the far north (including Africa and some parts of Australia) and it breeds within 300 miles of England even now. Throughout its range the Red Kite is found in wooded valleys, or lowlands with scattered woods, even park-land, but

it is not normally a bird of cities and towns. The Black Kite, on the other hand, is the town-scavenger of Africa and the East. There seems then to be the attractive possibility that the London kites may have been Black Kites, but R. S. R. Fitter has drawn attention (1949, *London's Birds*, pp. 101-102) to a piece of evidence which points the other way. A. H. Evans in his *Turner on Birds* . . . . 1544 (1903) quotes the following passage from the writings of the 16th century ornithologist William Turner:

"I know of two sorts of kites, the greater and the less; the greater is in colour nearly rufous, and in England is abundant and remarkably rapacious. This kind is wont to snatch food out of children's hands, in our cities and towns. The other kind is smaller, blacker, and more rarely haunts cities. This I do not remember to have seen in England, though in Germany most frequently".

At first sight this would appear to settle the matter, for we must assume that Turner was including London in his reference and he does specifically refer to these rufous birds "in our cities and towns". However, it would perhaps be wise not to lose sight of the other possibility, particularly in view of the remark of another contemporary naturalist. Fitter, again in *London's Natural History* (*loc. cit.*), writes as follows: "Charles Clusius, the great Flemish botanist, who visited England in 1571, thought there were as many kites in London as in Cairo . . . .". But the kites of Cairo are Black Kites . . . .

The two species are not hard to distinguish. In fact, as I remarked in an earlier discussion (*antea*, vol. xlix, pp. 140-141), the Black Kite is as likely to be confused with a dark Marsh Harrier (*Circus aeruginosus*) as with a Red Kite, a confusion that is not likely to happen with the present species, though as previously stated there is always the useful distinction between harriers and kites that the former glide with their wings in a shallow "V", the latter with them level. Long glides, indeed, plus a particularly buoyant mode of flight, slow wing-beats and a continual twisting use of the tail as a rudder, are characteristic features of the flight of kites. The Red Kite is easily separated from the Black by its deeply forked tail (plate 31) which still shows a fork when spread (plate 32 upper); by its general colour and more slender build (see all these plates); and in flight, from below, by the enormous white patch on each wing, on the underside of the primaries. These patches are sometimes even more extensive than drawings suggest, and extend to both edges of the wing (see plate 30). Its long, narrow, angled wings and the deeply forked tail give it a much more finely built appearance. At close range the much redder and more patterned plumage stands out (compare these plates with those of the Black Kite, *loc. cit.*). The upper-parts (plates 26, 27 and 31) are red-brown, patterned by light borders to the feathers, while the rufous under-parts (plates 27, 29 upper, and 30) are much more strongly streaked. The head, also streaked, is lighter than the rest of the body and may be any of various shades of grey, yellow or white, perhaps

according to the age of the bird. At the nest where these photographs were taken the male had a head of "gun-metal grey", the female a pale lemon-coloured one: this may suggest that the female was an older bird, for the tendency seems to be towards increasing lightness on the head.

We found our nest on 7th May when it contained two small young about 17-20 days old, which suggests that the eggs were laid about mid-March, roughly a month earlier than is usual in Wales. The normal clutch consists of 2 or 3 eggs and, as these are laid at about 3-day intervals and incubation starts with the first, it was to be expected that one of the young would be a little older than the other, as was evidently the case. The position of the nest, which was 34 feet up in a cork oak, can be seen in plate 25 (left) just to the right of the hide (actually a distance of 11 feet). It was typically sited in a fork in one of the main stems of the tree—unlike the Black Kite, this species does not often seem to build out on a horizontal side branch—and, as can be seen in the photographs, it was the usual flattish conglomeration of sticks and earth, lined with all sorts of rubbish, rags, paper, grass and hair. We built the flimsy pylon structure on which the hide is standing, slowly over a period of five days (10th-14th May), never working more than a short time each day for fear of disturbing the birds. It was indeed with great trepidation that we tackled the project at all, because it is well known how a little disturbance can cause the Welsh Kites to desert even well-grown young. But apparently we need not have worried, for each morning when we arrived we found the young Kites in excellent condition and twice one of the adults was at the nest when we reached it. Indeed, when photography started, it was found that the Kites were not unduly suspicious of the structure, twice returning to the nest within a quarter of an hour of the hide's being occupied, and they looked askance only when wind caused the platform to slip a little.

In four days a total of 34 hours was spent in the hide by Messrs. Eric Hosking, Roger Tory Peterson and G. R. Shannon. During this time a record was kept of the food brought to the nest in the 35 visits paid by the adults. Lest this should seem rather a low average, it should be added that the hide was only once occupied before 10.30 a.m. and it seems clear that, in common with many other birds of prey, a significant part of the feeding is done in the early morning. Indeed, in the middle of the day the young were sometimes obviously not at all hungry and refused food offered to them. In the 34 hours the female came to the nest 18 times, bringing food on 11 occasions, while the male came 16 times, bringing food on 9 occasions (and once in a quick, non-feeding visit the sex of the adult was not determined). The commonest food was Rabbit (*Oryctolagus cuniculus*) which was identified on 8, probably 9 occasions, and



4 records of unidentified "meat" may also have referred to Rabbit. Other prey included snake (twice), Garden Dormouse (*Eliomys quercinus*) (once), Red-legged Partridge (*Alectoris rufa*) (once), ? Spotted Salamander (*Salamandra maculosa*) (once) and carrion (twice). The Kite is not quick enough normally to catch flying birds and so most of its prey, whether bird or terrestrial animal, is surprised on the ground. But we sometimes saw dragonflies (Odonata) and beetles (Coleoptera) taken on the wing, as described in *The Handbook*—caught with the feet and transferred to the beak in mid-air. No small prey of this kind, however, was brought to the nest, nor were lizards or frogs, both of which we saw captured. It was clear that on the Coto Doñana the Kite is less of a carrion-eater than the Black Kite and this is supported by the nest-observations.

Normally the female remained with the young after bringing food and in the 15 visits that her length of stay was recorded she spent between 10 and 159 minutes there (average  $48\frac{1}{2}$ ). The male, on the other hand, usually left as soon as he had deposited the food and his longest stay at the nest was 7 minutes, though he sometimes spent quite long periods perched in the tree. If the female was at the nest when he arrived, she would usually snatch the food from him, almost without waiting for him to settle (plate 28 upper), and it is interesting to compare this rough action with the tender way in which small morsels are fed to the young (plate 28 lower). Usually the male did no more than bring the food to the nest, but once or twice he fed the young himself. Like most Kites' nests, this one was littered with bits of rag, paper and food-remains, and the adult female during her visits occasionally played with these items, sometimes feeding or attempting to feed the young on bits of litter. Once, while G. R. Shannon was in the hide, she flew in to the nest carrying a piece of rag which she deposited.

At times the adults were quite noisy and excited exchanges took place. The calls were chiefly the high-pitched mewing (higher than that of Black Kite) and a prolonged whinny, or a combination of the two, but a more fluty note, apparently a version of the whinny, was also recorded. The female on the nest not infrequently responded to the male flying overhead (plate 25 right), and the young would also answer the adults, with an abbreviated but similar note. Wing-flapping (plate 29 lower) was, as with all birds of prey, an ever-increasing occupation of the young as they grew older; otherwise they dozed, or played with the litter, or watched anything moving—from the adults flying overhead to the activities of a pair of Blue Tits (*Parus caeruleus*) in the tree.

In conclusion, it should be added that several times we saw the adult Kites attack and occasionally grapple with one or more of the Black Kites that were nesting in other trees in the area—an

animosity that may have been excited, or at least exaggerated, by the disturbance of our presence at the site. Once, too, the pair of Red Kites locked talons and fell twirling for perhaps a hundred feet before parting—an action that I have seen on other occasions with both Red and Black Kites, Imperial Eagle (*Aquila heliaca*), Short-toed Eagle (*Circaëtus gallicus*) and Peregrine (*Falco peregrinus*) and which has been discussed by Dr. C. Suffern (*antea*, vol. xlix, pp. 37-38).

## NEOTTIOPHILUM PRAEUSTUM IN BIRDS' NESTS

By D. F. OWEN

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### LIFE HISTORY AND HABITS

NEOTTIOPHILUM PRAEUSTUM Mg. is a species of fly of the order Diptera with no close relatives, being the only member of the family Neottiophilidae. The larvae are ectoparasites of nestling birds and live in the lining of the nest, periodically attaching themselves to the nestlings and sucking blood. They are thus similar in habits to the unrelated *Protocalliphora azurea*, discussed earlier (Owen, 1954; Owen and Ash, 1955). *Neottiophilum* seems much rarer in Britain and Europe than *Protocalliphora*, but there are few published records and doubtless the species has been overlooked.

The adult flies are not parasitic, but lay their eggs in the nests of birds, each female laying about 100-120, though not all in the same nest. After a short interval the larvae hatch and live in the nest material and from time to time attach themselves to the nestlings and take a meal of blood. When fully grown the larvae are 10.5 mm. long and 2.8 mm across the middle. The anterior portion of the body is narrow and pointed and the posterior is wide. The segmentation is not well marked and is partly hidden by accessory protuberances and transverse folds. The head and mouth are adapted for the parasitic mode of life, quite unlike an ordinary carrion-feeding blow-fly. When fully fed the larva may become dormant and remain in the nest for some months before pupation. Larvae found in the nest of a Greenfinch\* at Oxford in early summer did not pupate until October, but it is not known if this is normal. The pupa is blackish and retains the characteristic shape of the larva, even the segmentation, and it is thus easily recognisable from the pupa of *Protocalliphora* which is smooth and like that of a blow-fly. The pupae remain in the

\*Scientific names of birds mentioned in the text are given on page 164.

nest until the following spring when the flies emerge, usually in March, April and May. (*Protocalliphora* are double brooded and the adult flies hibernate in sheltered places.) Fuller details of the structure of the larvae and pupae, including figures, are given by Keilin (1924) and Tate (1954), and there is also a brief account in Séguy (1955). Some of the above facts have been taken from these papers.

#### DISTRIBUTION AND HOST RECORDS

Bezzi (1922) states that *Neottiophilum* is known only from France, Germany and Austria, but Séguy (1955), without giving details, says that it is found throughout the Palaearctic. For Britain, I have found records for Cumberland, Lancashire, Northumberland, Cheshire, Yorkshire, Nottinghamshire, Herefordshire, Suffolk, Bristol, Cambridgeshire, Gloucestershire, Hampshire, Sussex, Kent, Surrey, Oxfordshire and Berkshire. Evidently the species is widespread, but I have no records for Scotland or Wales.

Niethammer (1937-42), quoting Eichler, gives the following list of hosts for Germany: Greenfinch, Linnet, Chaffinch, House Sparrow, Treecreeper, Blackcap, Song Thrush, Blackbird, Nightingale and Sparrowhawk. The record from the Sparrowhawk may, of course, have been due to the parasite being brought into the nest with the prey. Séguy (1955) gives a similar list, but does not state the source of his records, which presumably may have been Eichler.

There are very few published accounts of the occurrence of *Neottiophilum* in the nests of birds in Britain. Keilin (1924), summarising the records known to him at the time, gives Song Thrush, Blackbird, Greenfinch, Chaffinch, Linnet and Blackcap. As many as 45 larvae were found in the nest of a Linnet, but the young survived. Armstrong (1955) gives several records of the fly having been bred from the nests of Wrens, including a record of 38 from one nest. Some nestling Wrens died, presumably as a result of the parasites. Rothschild and Clay (1952) state that the principal hosts are Passerines and add that Basden\* has reared it commonly from the nests of Blackbird, Carrion Crow, Linnet, and "thrushes, finches and warblers". They add that it has also been recorded once from the nests of Nightingale, Treecreeper, Dunnock and "sparrow". Tate (1954) records it from the nest of a Linnet, a Song Thrush and a Greenfinch. The young in the Linnet's nest died.

To the above I can add the following unpublished records, most of which have been kindly sent by people who have bred insects from birds' nests. I. J. Ferguson-Lees sent me 30 flies bred from 37 dipterous larvae from the nest of a Dunnock found in Sussex, 28 of which were *Neottiophilum* and two *Protocalliphora*. This is

\*Mr. E. B. Basden informs me that he will shortly be publishing a paper on the parasites he has bred from birds' nests.



the only record I have of the two species of parasite occurring in the same nest. J. K. Bates has twice found *Neottiophilum* in nests of the Dunnock near Oxford, and there are also specimens in the collection at the British Museum from nests of this bird. L. Parmenter has once recorded *Neottiophilum* from the nest of a Blackbird in Surrey, and J. K. Bates has found it three times in the nest of this species near Oxford. There are also specimens in the British Museum from nests of this bird. It has been found once in the nest of a Mistle Thrush in Cumberland and the specimens are now in the Manchester Museum. I have bred it from the nest of a Greenfinch found at Oxford and G. B. Thompson informs me that there are specimens from the nest of this species from Lancashire in the Manchester Museum. It has been recorded from nests of the Linnet in Northumberland and at Oxford (G. B. Thompson), and there are specimens in the British Museum from the nest of a Chaffinch. J. E. Collin informs me that he has often bred *Neottiophilum*, including at least four times from the Song Thrush and once from the Blackbird. There are doubtless many more specimens in private collections and in museums which would make this list more complete. A list of the European hosts is given in the Appendix.

#### DISCUSSION

As already mentioned, the habits of *Protocalliphora* are very similar to those of *Neottiophilum*, both species being parasitic on nestling Passerines and both being highly adapted to the life-cycle of the host. The eggs of the parasite must be laid at the correct time (when there are eggs or small young in the nest) otherwise the nestlings would leave the nest before the larvae were fully fed. Also, the breeding-season of the flies must be adjusted to that of the birds. If too many eggs of the flies were laid in one nest the nestlings presumably might die through loss of blood and this in turn would result in the death of the larvae if they were not fully fed. The death of one or more of a brood of nestlings has been recorded several times when *Protocalliphora* larvae have been present in exceptionally large numbers, but there is little evidence of this in *Neottiophilum* (probably because there are few records of the occurrence of this species anyway). The question now arises as to whether there is any competition between the two species of parasite. It has been found that *Protocalliphora* most frequently occur in the nests of hole-nesters and birds that build compact nests, such as tits, Hirundines and flycatchers, and much less frequently in the nests of such birds as thrushes and finches (Owen, 1954). On the other hand *Neottiophilum* are not often found in the nests of hole-nesters, but most frequently in open nests, such as those of thrushes and finches. It therefore seems likely that the possibility of interspecific competition between these two species of parasitic fly might be reduced because they tend to

select different types of nest in which to lay their eggs. But many more host records for *Neottiophilum* are desirable before this can be fully established. There is only one record of the two species being found in the same nest and this may have been exceptional. In North America, where there are several species of *Protocalliphora*, each species tends to specialise on nests in certain situations. Thus one species, *P. metallica*, is parasitic on ground-nesters, though otherwise shows no host specificity (G. F. Bennett, *in litt.*).

If the larvae of *Protocalliphora* or *Neottiophilum* are present in the nest of a Passerine in any quantity, it is probable that their presence will have some effect on the weights of the nestlings. I suggest that when the nestlings are being weighed the nests should later be examined for these parasites. Perhaps this might help to explain some of the weight variations found.

#### ACKNOWLEDGEMENTS

I am grateful to L. Parmenter, J. E. Collin, G. B. Thompson and J. K. Bates for records of *Neottiophilum*, and to I. J. Ferguson-Lees for sending me the flies bred from the Dunnock's nest.

#### SUMMARY

1. The life history of *Neottiophilum praeustum*, a species of fly whose larvae are ectoparasites of nestling birds, is briefly described.

2. British and Continental host records are given. The species is probably adapted to open-nesting birds, and this might reduce competition between it and *Protocalliphora azurea* which is mainly parasitic on hole-nesters.

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## APPENDIX—THE EUROPEAN HOSTS OF NEOTTIOPHILUM PRAEUSTUM

Sparrowhawk ( <i>Accipiter nisus</i> )	Nightingale ( <i>Luscinia megarhynchos</i> )
Carrion Crow ( <i>Corvus corone</i> )	Blackcap ( <i>Sylvia atricapilla</i> )
Treecreeper ( <i>Certhia familiaris</i> )	Duncock ( <i>Prunella modularis</i> )
Wren ( <i>Troglodytes troglodytes</i> )	Greenfinch ( <i>Chloris chloris</i> )
Mistle Thrush ( <i>Turdus viscivorus</i> )	Linnet ( <i>Carduelis cannabina</i> )
Song Thrush ( <i>Turdus philomelos</i> )	Chaffinch ( <i>Fringilla coelebs</i> )
Blackbird ( <i>Turdus merula</i> )	House Sparrow ( <i>Passer domesticus</i> )

## POSTSCRIPT

Since writing this paper I have received a letter from Mr. E. C. Pelham-Clinton of the Animal Diseases Research Association, Edinburgh. He has bred *Neottiophilum praeustum* from the nests of Blackbirds, Song Thrushes and finches collected in 1951 and 1954 from Penicuik, Midlothian; from St. Fillans, Perthshire; and from Whitekirk, East Lothian.

## NOTES

**Longevity of a White-fronted Goose.**—Mr. W. H. Lemburg, of Boelus, Nebraska, informs me that he wing-tipped a young female White-fronted Goose (*Anser albifrons*) whilst shooting on the North Platte river in the autumn of 1903 or 1904—he is not sure which—and took the bird back to his farm. He goes on to say, "I don't remember how many ganders I had with her but at least half a dozen. I cannot say how long she was in my flock before she decided to raise a family but at least 15 or 16 years. Her very first eggs were fertile and nearly every egg of hers would hatch each season and as far as I and a lot of other bird breeders know, . . . she is the start of a breeding flock of domesticated White-fronts. Many bird men in U.S. have White-fronts nesting now and all can be traced back to this old faithful goose, but she is only history now as she died in the summer of 1950. The last two or three years of her life, she could hardly get around but laid fertile eggs and hatched them up to the last season".

This remarkable bird was thus at least 46 or 47 years old when she died and was laying fertile eggs to the end. I saw her in 1948, when she was almost crippled with rheumatism, nesting in company with Snow (*Anser hyperboreus*) and Cackling Geese (*Branta canadensis minima*) on a huge pile of straw in the farmyard.

NIALl RANKIN

**Unusual Goshawks in Cambridgeshire and Norfolk.**—On 9th March 1955 T.C.S. observed a Goshawk (*Accipiter gentilis*) flying over the Ouse Washes near Welches Dam in Cambridgeshire. It appeared to be appreciably larger than some Wigeon (*Anas penelope*) which it disturbed from the Washes; its shape resembled



that of a Sparrowhawk (*Accipiter nisus*), but the tail was rather shorter and the wings longer and more angled. The upper-parts were *pure slate-blue*—noted as intermediate in shade between that of a male Sparrowhawk and a male Montagu's Harrier (*Circus pygargus*)—there was a pale shade on the rump, and the tail seemed unbarred. The under-parts were examined closely, and seemed to be unmarked, a nondescript whitish-grey or perhaps buff.

On 26th February and 4th March 1956, Messrs. E. J. Cottier and P. North reported having seen a Goshawk on the Ouse Washes at Oxlode in Cambridgeshire and at Welney in Norfolk, which they described as having *bluish-grey upper-parts*. The bird was observed harrying ducks, and even Bewick's Swans (*Cygnus bewickii*) rose as it approached. We failed to see this bird on visits to the Washes at this period, but on 19th March I.C.T.N. watched what was evidently the same bird near Oxlode. It was again seen terrorizing ducks, and appeared much larger than Wigeon or even Pintail (*Anas acuta*): it was thought to be a large female. The shape was again not unlike that of a Sparrowhawk, but the wings seemed broader at the base and longer than in that species, and tapered almost to a point in ordinary flight; when flapping they appeared more flexible than those of a Sparrowhawk, and the flight was more erratic and manoeuvrable, suggesting a gigantic Merlin (*Falco columbarius*). The bird was seen to work along a ditch in a harrier-like manner, hovering ponderously every few yards, and finally it soared up and flew away to the north. The upper-parts appeared *dark grey with a slight, but distinct, bluish tinge*, and the tail was indistinctly barred; a light eye-stripe was fairly noticeable even in flight, and the under-parts were narrowly but indistinctly barred on a greyish-white background.

We may add that we are both fully familiar with the Goshawk, and that the flight and general appearance of these birds was in every way characteristic of that species.

Although the two descriptions do not agree in all particulars, the coincidence of the presence of birds with the same peculiarities of plumage at the same place in successive years suggests that the two occurrences were not unconnected. Reference to *The Handbook* and other authorities indicates that the blue-grey colouration of the upper-parts is characteristic of the American race (*A. g. atricapillus*) or one of the Asiatic races, but further enquiries have shown that such birds are not unknown amongst European breeding-populations, and in fact on 30th September 1955 I.C.T.N. and Mr. R. A. F. Cox observed a Goshawk at Børsmose, west Jutland, with upper-parts of a still paler bluish-grey—resembling those of a male Merlin. Other variations may occur—Mr. D. D. Harber (*in litt.*) has described to us a Goshawk seen in Sussex on 16th November 1955 with upper-parts “very dark slate-grey with no trace of brownish”, in this resembling

the S. European race (*A. g. arrigonii*). It seems more probable, however, that all these birds belonged to the typical race, and we therefore record these observations without expressing an opinion as to subspecies; further investigation of the incidence of these plumage variations amongst European Goshawks would be very valuable.

I. C. T. NISBET and T. C. SMOUT

**The Hen Harrier as a breeding bird in Norway.**—The first record of Hen Harriers (*Circus cyaneus*) breeding in Norway was in 1884, in Fokkstumyra in the Dovre Fjell. This remained the single known breeding-locality in Norway up to 1926, when two nests were found in Vågå in the western part of Gudbrandsdalen. As early as 1902 the species was observed during the breeding-season in Sør-Varanger in E. Finnmark, but the first breeding was not recorded there until 1927.

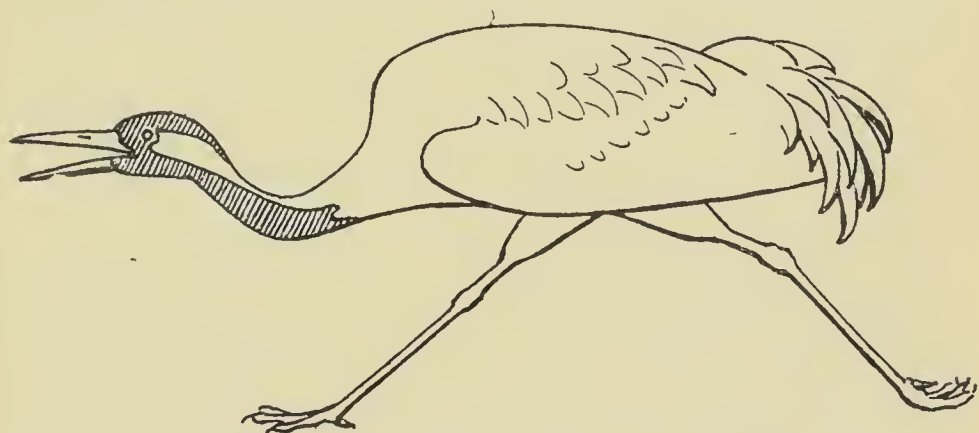
In 1936 the Hen Harrier was found nesting in Öyer in the south-eastern part of Gudbrandsdalen. Since then, however, no locality has been added to our knowledge of the species' breeding range in Norway, in spite of much increased ornithological activity in our country from about 1930 onwards. It is supposed, however, that the Hen Harrier breeds even on Hardangervidda and in the fells of Valdres. Curiously, no one has hitherto been able to close the huge gap in the range between Dovre (62° 15' N.) and Finnmark (69° 30' N.), unless we include Swedish records of breeding Hen Harriers in Jämtland (in 1949) and in Lapland.

Nesting records of the Hen Harrier have increased considerably in Norway during the period 1930-50, as will be seen from the known number of nests found each year from 1884 up to 1950. Years for which no nest is known, are excluded. The figures are: 1884-2; 1926-2; 1927-2; 1929-1; 1930-1; 1936-1; 1938-5; 1941-8; 1942-9; 1943-2; 1945-5; 1946-6; 1948-2; and 1949-3. The figures from the 1950's are not reliable, because much is unpublished as yet. What the figures seem to tell about an increase in the Norwegian population of Hen Harriers is, however, much obscured by the fact that an intensive study of this species was initiated in the late 1930's. YNGVAR HAGEN

[This summary which Dr. Hagen has kindly supplied is of particular interest as a comparison with the fluctuations in the Scottish breeding-population of Hen Harriers—fluctuations which are discussed in our reviews of changes in status of Britain's rarer birds of prey (see pages 143-146).—Eds.]

**Distraction-display of the Crane.**—The recent article on the Crane (*Grus grus*) (*antea*, vol. xlix, pp. 435-437) reminds me that when I was photographing these birds in the Dovre Fjell in Norway, in May 1951, I witnessed an interesting distraction-display which appears not to have been previously recorded. At one nest the single egg hatched on 8th May and I examined the chick an hour later. As I approached the nest, which was in the

middle of a typical quaking bog, the chick ran off and confidently swam across a six-foot pond. While I was looking for it in the long grass, the parents circled in flight at a distance of 300ft., sounding a low growling note which I wrote down as "ror-r-r". Both then alighted and began running in decreasing circles around the nest-site, finally approaching to within 150ft. At intervals they called a guttural "kr-r-ook". The female, easily distinguished by paler head-markings and a conspicuous chestnut patch from the base of the neck to the upper scapulars, then adopted a remarkably mammal-like, crouched attitude as shown in the sketch, running rather slowly, but with very long, buoyant strides through the tundra. The movements instantly reminded me of the bounding run of a deer and seemed therefore closely analagous to the "rodent-run" of the various plovers. The head was carried below the level of the shoulders, and the wing "wrists" were slightly drooped, while the rather hunched back heightened the similarity to a running mammal. The bill was kept open, but the bird did not call. After circling me twice, the female flew and was quickly joined by the male and both birds circled overhead until I left.



DISTRACTION-RUN OF THE CRANE (*Grus grus*)  
(Drawn by Guy Mountfort)

A second female which I watched at another nest also had the extensive chestnut marking on the upper back and mantle, but otherwise had fully adult plumage. This colouring is not mentioned in *The Handbook*. A third nesting female lacked it entirely.

The newly-hatched chicks had pale pink bills and legs, but the colour changed to grey after three hours. The eyes were dark brown. The very thick, short down was between cinnamon and light chestnut above, darkest on the dorsal side of the neck and in the centre of the back. It was very pale buff below (not



reddish-buff as stated in *The Handbook*) and almost white on the crown, chin and centre of the belly. The call-note of the nestlings was a high, piping "chooeet". Within two hours all the nestlings had left the nests and had hidden in the low vegetation, where they were brooded by the females. Three days later I could still locate them within 200 yards of the three nests. GUY MOUNTFORT

**Moorhen feeding by "up-ending".**—I have seen no reference to the Moorhen (*Gallinula chloropus*) obtaining food by "up-ending" in the manner of surface-feeding ducks, and the behaviour is probably unusual. On 1st April 1956, at Chesterton Pool, Warwickshire, I watched a bird using this method several times in succession. The position was reached by means of a convulsive jump and the bird remained inverted for a few seconds. It appeared to be pecking at some underwater plants, but no food was seen to be brought to the surface. J. LORD

**Unusual call-note of Green Sandpiper.**—On the night of 9th December 1956, D. J. Millin, R. G. B. Brown and I trapped a Green Sandpiper (*Tringa ochropus*) at Sandford sewage farm, Oxford, which persistently used a most unusual call-note, like the normal call of a Wood Sandpiper (*T. glareola*). The attention of two of us (D.J.M. and J.M.B.K.) had first been caught on 18th November, when we heard after dark a typical Green Sandpiper call, accompanied or immediately followed by (we are not sure which) a sharper trisyllabic call like a Wood Sandpiper; we heard both several times.

We heard this "Wood Sandpiper" call again several times on 9th December in the dark, and did not hear a typical Green Sandpiper call all the time we were there. We found the colouring of the bird confusing by torchlight, but took a full description with measurements, and on release it uttered at once a clear short trisyllabic note which I can only describe as corresponding exactly to the "chiff-iff-iff" of *The Handbook's* description of the Wood Sandpiper call. On our checking description and measurements with *The Handbook* and with skins in the Oxford University Museum there was no doubt that the bird was a Green Sandpiper.

*The Handbook* briefly mentions a "sharper 'wit-wit-wit' . . . perhaps not essentially different from common note on breeding ground . . .". This may well be the note referred to, but there is no clear statement of its resemblance to the Wood Sandpiper call note. As these call notes are regarded as diagnostic, I feel sure that if in daylight I had had a rather poor view of this bird, and then heard this call, I would have been satisfied to record it as a Wood Sandpiper. It is only due to the happy chance of catching the bird and so having its measurements that I am able to be satisfied with the identification. The important point is that it persistently used this short call and no other. J. M. B. KING

**The identification of Savi's, Grasshopper and River Warblers by means of song.**—The 1954 record of Savi's Warbler (*Locustella luscinioides*) in Cambridgeshire (*antea*, vol. xlix, pp. 326-327) raises the question of the value of song in the identification of *Locustella* species. By an unfortunate error I was quoted as having noted "significant differences" between the recordings of the bird on Wicken Fen, made by Dr. P. Marler and myself, and those of the Grasshopper Warbler (*L. naevia*), whereas the differences I noted I regarded as only very doubtfully, if at all, significant. Unfortunately, it was not possible at the time to assess the value of these differences since no authentic recording of Savi's Warbler was then available. This has now been remedied, however, by Eric Simms' excellent recording of Savi's Warbler in Spain (B.B.C. Record Library), and so it is possible to take the matter a step further. Since recordings of the River Warbler (*L. fluviatilis*) are available as well, that species has also been included. I am very grateful to the B.B.C. for having put their whole collection of records at my disposal for study. There is also a recording of *L. fasciolata*—Gray's Grasshopper Warbler, of Japan—but the voice of that species is so entirely different that there is no point in including it. Pallas's Grasshopper Warbler (*L. certhiola*) and Lanceolated Warbler (*L. lanceolata*) have, as far as I know, never been recorded.

The songs of *L. luscinioides*, *L. naevia* and *L. fluviatilis* have four obvious characteristics which could be of use in identification: (1) number of notes per second; (2) frequency or frequencies in cycles per second at which most of the energy is being utilized in the individual notes (this is roughly speaking what we mean by the "pitch" of the notes); (3) duration of the "bursts" of the notes; and (4) tonal quality of the notes. Of these four characteristics, Nos. 1-3 can be measured relatively easily by modern techniques of recording and analysis. No. 4 is much more difficult to assess since not only does it depend on complexities of distribution of energy in the frequency "spectrum" of the sound, which may be very hard to measure; it is also much more affected by the circumstances under which the bird is heard or recorded (e.g. loudness, distance, interference, reflexion from neighbouring objects, characteristics of the apparatus, etc.). In general, if the energy is spread randomly over a wide range of frequencies, the note will sound harsh or strident whereas if it is concentrated on certain fundamentals and harmonics the note will sound more musical.

The characteristics of these three songs are tabulated below. Mr. Simms, studying the records in 1955, had observed that *naevia* and *luscinioides* both have "notes" consisting of two separate pulses. The present analysis confirms this and shows that each is of about  $1/120$  second's duration. The two components of each "note" are too fast and too close together to

be heard as completely separate by the human ear though it may well be that this duplex construction is perceived by some persons as conferring a characteristic tonal quality.

ANALYSIS OF SONGS OF THREE *Locustella* SPECIES

Species and Recording No.	Duration of bursts of song	Number of pulses per second	Main frequency of sound ("pitch") in cycles per second
<i>L. naevia</i> England B.B.C. Lib. 15002B	Long, often more than 1 minute; average about 30 secs.	31 double	4500-7000, with peak at 5000
<i>L. luscinioides</i> Spain B.B.C. Lib. 25002A	Shorter, usually less than 1 minute; average about 20 secs. (3 songs)	53 double	Ranging from 500 to 6500, with energy peaks at 2000 and 4000
<i>L. fluviatilis</i> Sweden D.L.O. 61308	Short; average 10 secs. (7 songs)	15 single	3000-5000, energy evenly, distributed between these two limits

It will be seen that the species are distinct in all three respects though the duration of the song-bursts seems the least reliable. The figures for frequency given in the third column throw some interesting light on the impressions of the sound received by human observers. Although a significant proportion of the energy in the sounds of *luscinioides* is operative at 6000 cycles, which is higher than any significant component of *naevia*, the former seems of lower pitch to most people because the main energy peaks are lower and are within the range of our musical instruments (e.g. piccolo and piano). Thus the top note (C) of the piano is 4096 cycles and the C one octave below is 2048 cycles. This is the explanation of H. Eliot Howard's impression of the song of *luscinioides* as "far more musical and in a way resembles the tinkling of tiny numerous bells" (*British Warblers*, 1907-14).

As to the second column, human observers do not seem to be so perceptive though of course the song of *fluviatilis* is obviously "slower" than the others. Alwyn Voigt (*Excursionsbuch zum Studium der Vogelstimmen*, 11 ed., Heidelberg, 1950) sums it up by saying (p. 61) that *naevia* rattles (klirren), *luscinioides* buzzes (schnurren) and *fluviatilis* grinds (wetzen).

To return now to the problematical Wieken bird. This had average bursts of 6-8 seconds, 34 double pulses per second, and a frequency of 4500-7000 cycles per second with main peak at 5000. Thus the two most reliable features strongly suggest that the bird was *naevia*, not *luscinioides*. We must, however, remember firstly that we do not yet have sufficient records to allow us to be dog-



matic about the range of frequency and pulse rate of the species as a whole: a good deal more material is desirable. Secondly, it is just possible that a single unmated *luscinioides* in a population of *naevia* might learn to sing like the latter. I should be surprised if this is the explanation, for we have evidence (H. Stadler, *Verh. VI. Int. Orn. Kongr Copenhagen*, 1926, pp. 338-357) that the song of *naevia* is inborn and one would expect that of *luscinioides* to be so too—though we now know enough about bird-song to know that this does not necessarily follow even with two species as closely related as these are.

But it is at least clear that the vocal performance of the Wicken bird cannot be used to support its identification as *luscinioides*; such a conclusion must rely entirely on the other evidence.

W. H. THORPE

[We regret the misinterpretation of Dr. Thorpe's views, but welcome his contribution to the analysis of differences between various *Locustella* songs. Further recordings of both *naevia* and *luscinioides* are desirable, and efforts to obtain these are in prospect. Meanwhile the identification of the Wicken Fen bird is firmly established by its plumage description, and the question how far its utterance may have deviated from the normal range for Savi's Warbler must await further material, as adequate data are not yet available.—EDS.]

**Bond between a captive Twite and a free one.**—At dusk on 24th July 1954, I trapped a juvenile Twite (*Carduelis flavirostris*) in a small box trap baited with docken and grass seeds in my garden in Foula, Shetland. By the time I had ringed, weighed and measured the bird it was nearly dark and I decided to put it to roost in the house overnight. The bird was placed in a small cardboard box with a piece of netting over the top, which I set on a shelf against the wall near the window. In order to stop the bird struggling to escape in the morning, I placed a book over the top of the box, allowing only a small space for air and light.

In the morning I went to reweigh the bird before release and found it sleeping silently with its head under its wing. Quite by chance I noticed another Twite sitting outside the window on the sill. On no other occasion had I ever seen a bird sitting on the flat exposed surface of the window-ledge, but on this occasion it was even more remarkable in that there was a fresh breeze from the south driving rain straight on to the window. I noted that the bird was sitting in the corner nearest to the shelf where I had placed the box containing the captive bird and in fact about three feet from it. But the window was firmly shut and the box was not visible from the outside; and, moreover, neither bird was heard to make any sound at all. By creeping under the window-ledge outside I was able to catch the second bird under a net without difficulty, and this turned out to be another juvenile.

On release, the bird which had been kept overnight returned immediately to a patch of weeds in front of the window and started feeding busily on the seeds. The second bird was released shortly afterwards and settled on a fence near-by. An adult Twite then flew down and settled beside the bird on the ground and fed alongside. Although there was no direct evidence of relationship such as food-begging by the young bird, the birds had the appearance of belonging to the same family party which had been frequenting the garden for some days. The adult bird then flew up to the fence and fed the other young bird in the normal manner. It seems likely, therefore, that the two young birds were members of the same brood. In any case the bond between them was remarkably strong when, in the absence of any apparent means of communication either visual or aural, one was prepared to undergo conditions of considerable discomfort to maintain a position as near as circumstances would allow to the other.

A similar bond between mated birds of a pair has been noted before and amply proved by ringing on Fair Isle (*Fair Isle Bird Obs. Bull.*, Vol. 2, No. 7, p. 327) but I know of no previous record where the bond could be proved to exist in the absence of known physical means of communication.

C. K. MYLNE

## REVIEW

NATURAL HISTORY OF BIRDS. By LEONARD W. WING. (*Ronald Press Company*, New York, 1956). 539 pages, 222 text-figures and numerous tables. Price \$6.75.

THERE is great need at the present time for a general biology of birds covering the whole field, and the present book fills much of this need. In its 539 pages it discusses all the problems which the learner in ornithology should know something about, including classification, morphology, physiology, evolution, zoogeography, ecology, behaviour, numbers, flight, migration, song, disease, protection, economic aspects, and equipment for field studies. Because its field is so wide, the treatment of each aspect is necessarily brief, but the aim (and value) of the book is its comprehensiveness; the field observer will perhaps read it chiefly for those points on which he is not so well-informed. The book is definitely a text-book, and written primarily for the classroom rather than the amateur's library, but within this limitation, it is clear, readable, balanced and careful. Most of the examples, though not all, are drawn from American birds, but this may prove refreshing rather than the reverse for the English reader. The references selected as leading are not always well chosen. Because it is a text-book, the reader cannot expect the presentation of new ideas in an exciting manner, but he is given a wide and accurate survey of existing knowledge, and after reading it, he might well be able to "major" in ornithology.

D. LACK

## NOTICE TO CONTRIBUTORS

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3. Certain conventions of style and lay-out are essential to preserve the uniformity of any publication. Authors of Papers in particular, especially of those containing Systematic Lists, Reference Lists, Tables, etc., should consult the ones in this issue as a guide to general presentation. English names of species should have capital initials for each word, except after a hyphen (e.g. Siberian Thrush, Yellow-headed Wagtail), but group terms should not (e.g. thrushes, wagtails). English names are those used in *The Handbook of British Birds*, with the exception of the changes listed in *British Birds* in 1953 (vol. xlii, pp. 2-3). The scientific name of each species should be given (in brackets and underlined) immediately after the first mention of the English name. Sub-specific names should not be used except where they are relevant to the discussion. It is sometimes more convenient to list scientific names in an appendix. Dates should take the form "1st January 1955" and no other, except in Tables where they may be abbreviated to "1st Jan.", "Jan. 1st", or even "Jan. 1", whichever most suits the lay-out of the Table concerned. It is particularly requested that authors should pay attention to Reference Lists, which otherwise cause much unnecessary work. These should take the following form:

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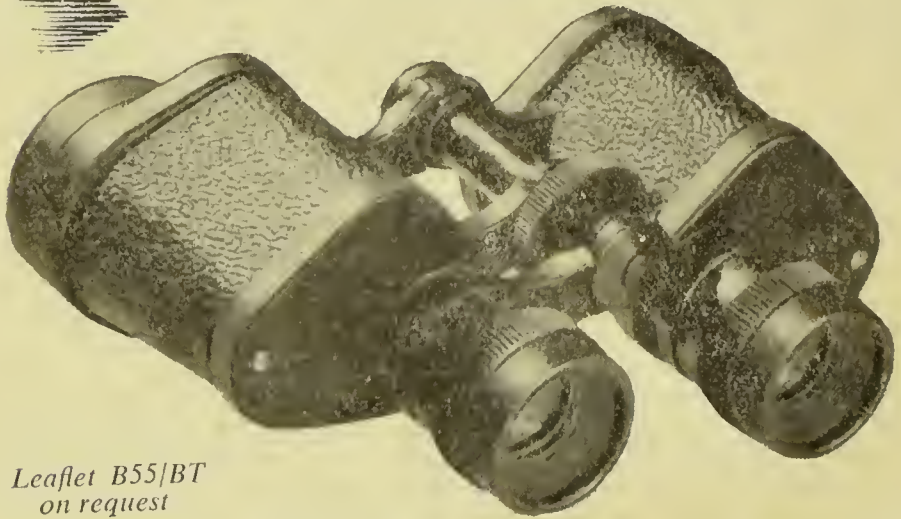
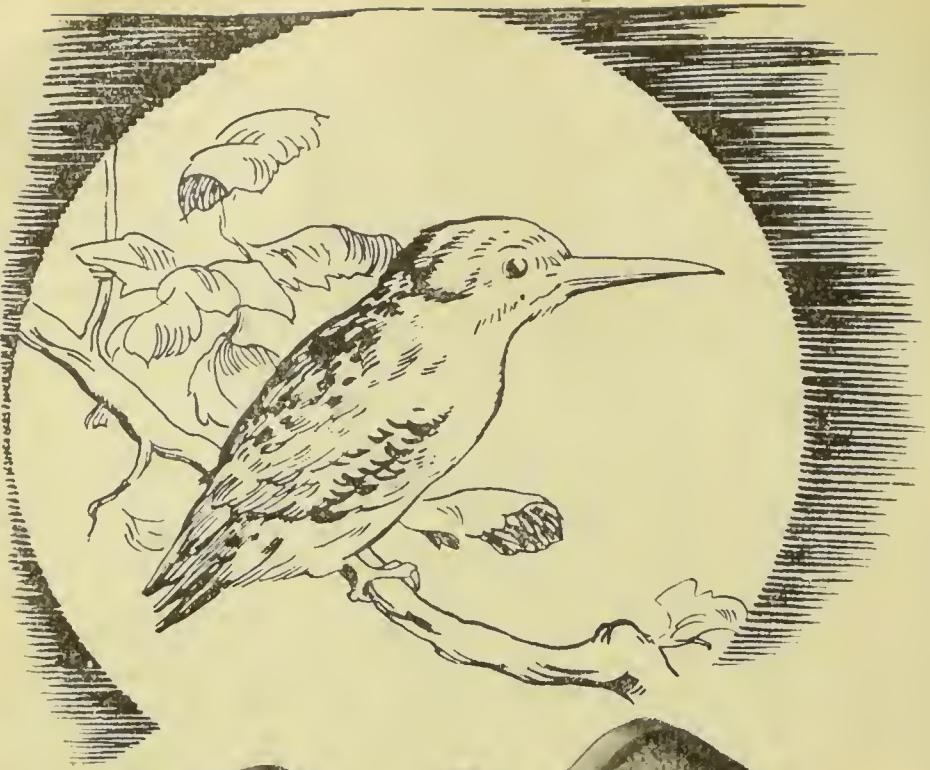
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# BRITISH BIRDS



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THREE SHILLINGS

# BRITISH BIRDS

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## CONTENTS OF VOLUME L, NUMBER 5, MAY 1957

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	PAGE
The past and present status of the Buzzard in the British Isles. By Dr. N. W. Moore ... ..	173
Photographic studies of some less familiar birds. LXXXI—Ortolan Bunting. Photographed by K. Koffán (plates 33-35). Text by I. C. T. Nisbet and I. J. Ferguson-Lees ... ..	197
Field-notes on some birds of S.E. Europe. By I. C. T. Nisbet and T. C. Smout ... ..	201
Notes:—	
Vagrants at Skokholm in September 1956 (Peter Davis) (plate 36 upper)	205
Little Buntings in Surrey (G. J. Harris). Drawn by P. J. Hayman (plate 36 lower) ... ..	206
Little Buntings in Middlesex (D. I. M. Wallace) ... ..	208
Atlantic crossing by Starling (G. F. Boyer) ... ..	209
Review:—	
<i>The Birds of the London Area since 1900.</i> By a Committee of the London Natural History Society (Chairman: R. C. Holmes) ... ..	210

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Cover photograph by Stuart Smith: Nightingale (*Luscinia megarhynchos*) at nest



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## BRITISH BIRDS

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### THE PAST AND PRESENT STATUS OF THE BUZZARD IN THE BRITISH ISLES\*

By N. W. MOORE

#### INTRODUCTION

MYXOMATOSIS spread from the Continent of Europe to the British Isles late in the summer of 1953. The Buzzard (*Buteo buteo*), which was known to feed extensively on Rabbits (*Oryctolagus cuniculus*), was likely to be indirectly affected by the disease, so that the time appeared most opportune for making a special study of this particular hawk. An ecological investigation of the species seemed particularly worth making in any case because the Buzzard is much the commonest large bird of prey now occurring in Britain. Accordingly, early in 1954, the Scientific Advisory Committee of the British Trust for Ornithology accepted the proposed survey as one of its "Trust-aided investigations", with the writer as organizer. The Nature Conservancy gave generous support to the Survey by allowing the writer to spend part of his working time on it and by giving much secretarial help.

The aim of the first (1954) survey was to record the Buzzard's status before it could be seriously affected by myxomatosis. In the course of writing a paper on the results of this 1954 survey, the writer was asked by the Editors of *British Birds* to contribute an article on the Buzzard for this series on birds of prey (see also *antea*, pp. 129-155), with the result that the original paper was modified and further historical research was undertaken, so that the final paper could perform the dual rôle of summarizing the 1954 Buzzard Survey and forming a part of the series on British birds of prey.

\*A Report to the British Trust for Ornithology.

The detailed aims of the paper are:—

- (1) To summarize what is known about the Buzzard's status before 1954.
- (2) To summarize the data of the 1954 Buzzard Survey.
- (3) To sketch the Buzzard's ecological status in Britain to-day.
- (4) To discuss the causes of population changes of the Buzzard during the last 150 years.

#### DISTRIBUTION IN THE PAST

The main sources of information about the distribution of the Buzzard in the past are the writings of contemporary naturalists. To-day the other large birds of prey are so rare that errors due to wrong identification must be slight. But when three species of harrier (*Circus* spp.), the Kite (*Milvus milvus*) and the Honey Buzzard (*Pernis apivorus*) could all be seen more or less frequently in Britain, all records, except those of reliable ornithologists, are suspect. John Ray (1678) distinguished between the Buzzard or Puttock, the Kite, the Honey Buzzard and the Bald Buzzard (Osprey, *Pandion haliaetus*) and the Moor Buzzard (Marsh Harrier, *C. aeruginosus*) and Ringtail or Hen Harrier (*C. cyaneus*)\*, but probably few of his countrymen did. The situation was further confused because the words, Buzzard, Puttock, Kite, Gled, Glede, meant different species according to region—all could refer to *Buteo buteo*. Recognition of these sources of error must be taken before accepting any records of a Buzzard.

In this section the past has been divided for convenience into four unequal periods. Each period is introduced with a summary of factors which were likely to have affected the status of the Buzzard at that time.

##### 1. *Pleistocene and Recent until 1100 A.D.*

After the last ice age, Britain was largely covered by forest, and the Rabbit which was to become an important source of food, either had not yet been introduced into the country, or if it had, was a rare animal. Fossil bones of *Buteo* species have been found as follows:—

##### *Pleistocene.*

Devon	(Brixham Cave)	(Bell, 1915)
Somerset	(Clevedon)	„ „
Kent	(Ightham)	„ „

\*This would include Montagu's Harrier (*C. pygargus*) which had not then been separated.

*Neolithic.*

Orkneys (Rousay) (Platt in Callender, 1934)

*Roman.*

Dorset (Weymouth) (Carreck, 1955)

West Meath (Lagore) (Hencken, 1950)

These records cannot be used as proof that the Buzzard occurred in Britain at the times indicated: some of the bones may be those of the Rough-legged Buzzard (*B. lagopus*). However, Mr. R. W. Sims of the British Museum (Natural History) reports that some bones of these species can be determined specifically; it would be worth while to re-examine this material.

## 2. 1100-1799.

During this time most of Britain was cleared of woodland and eventually enclosed, and the Rabbit became one of our most abundant species. During the last years of the 18th century game preservation began to have a significant effect on the fauna of England.\*

In an Act of James II of Scotland (1457) the Buzzard is listed as one of the "foullys of reif" to be destroyed. In the law 25 Henry VIII, CII, in which egg stealing was forbidden, it was stated that the act did not extend to such as kill "crows, choughs, ravens and buzzards". During the 17th Century the Churchwarden of Tenterden in Kent paid 1d. or 2d. for every Buzzard head brought to him (Ticehurst, 1920).

William Turner (1544) mentions the Buzzard and says that it was seen at all times. About this time a difference was made between the Buzzard and the Moor Buzzard (Marsh Harrier). The fact that the word "Buzzard" developed the secondary meaning of a worthless, stupid or ignorant person, suggests that it was well known. Culinary and medicinal qualities of the Buzzard were extolled by Lovell in 1661.

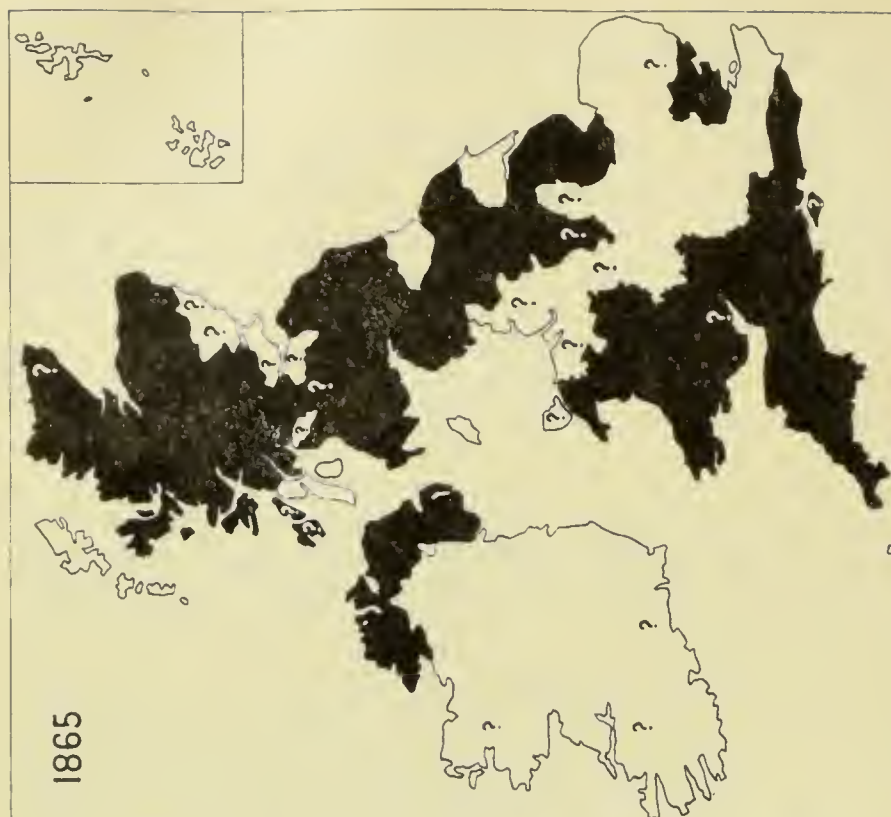
The first reliable record of the Common Buzzard is that of John Ray (1678). The fact that he gives no details of distribution suggests that it was generally distributed in the 17th century. It remained so in the 18th century when Pennant described it as the "commonest of the hawk kind we have in England" (1776) and when John Latham called it "a bird known by everyone" (1781). The first records of individual specimens and exact localities belong to the end of the 18th century.

## 3. 1800-1915.

During this period most of the remaining waste lands were reclaimed, large areas became industrialized and, in the second half of it, agriculture declined. Rabbits became much commoner. Game preservation became one of the principal activities of the countryside. The Highlands were opened up to the visiting sports-

\*As early as 1768 R. Smith suggested ways of catching Buzzards among other "winged vermin" in order to protect pheasantries and warrens.





KEY: Black—Breeding proved, or good circumstantial evidence of breeding.  
 ? on Black—Circumstantial evidence suggests that breeding probably took place.  
 ? on White—Inadequate evidence of breeding.  
 White—No evidence of breeding.



FIG. 1—CHANGES IN THE DISTRIBUTION OF THE BUZZARD (*Buteo buteo*) IN THE BRITISH ISLES, 1800-1954

men (the railway reached Perth in 1849, Inverness in 1861 and Thurso in 1874). The breech-loader was invented in 1853. The vogue for making private collections of birds and eggs was at its height, though the first Wild Birds Protection Act was passed in 1880.

At the beginning of the century it is probable that the Buzzard bred in practically every county of the British Isles. It appears to have been commoner in England than Scotland (Yarrell, 1837). As late as 1846 Macgillivray stated that it was generally distributed in Britain and "occurs also in Ireland". But the decline that had begun in the early years of the century increased. In the 1860's A. G. More organized his pioneer survey of the distribution of the country's breeding birds by means of a simple and effective questionnaire. From the information received he described the Buzzard as "by no means common and nearly exterminated in the eastern and midland counties of England" (More, 1865). It held out in Essex until 1865, in East Sussex until 1882, and in Lincolnshire until 1888. By 1897 it was sufficiently rare for Dixon to include it in his "Lost and Vanishing Birds" and to state that it would become extinct "if persecution be not relaxed". The species had become a protected bird in 1880.

In the B.O.U. list of 1915, the distribution is described as "West and Central Scotland, Inner Hebrides, Lakes, Wales, Devon and Cornwall commonly, Pennines sparingly".

#### 4. 1916-1954.

The two world wars caused revivals in agriculture, but between them there was a decline. Towns became much larger. The two wars and the economic depression caused a reduction in the size of estates and decreases in game-preservation. Bird-watching became popular: the collecting of specimens was largely superseded by the collecting of records.

By the end of the first world war the Buzzard had returned to much of its old range in Southern England, the Welsh Border country and elsewhere (see Witherby, 1924). In some districts it was later exterminated, but in others it held its own.

In 1929 H. G. Hurrell organised a special study of the species in Devon for the newly formed Devon Bird Watching and Preservation Society (1929). 46 pairs of Buzzards were recorded in a total area of 305.79 sq. miles. From this Hurrell estimated that the total Buzzard population in Devon at the beginning of the breeding-season in 1929 was between 900 and 1,200 birds.

At the onset of the second world war, it was found breeding regularly in Hampshire, Dorset, Somerset, Hereford and Shropshire. Further west it had become very numerous.

In 1946 W. J. Ashford made a study of the species in Dorset (Blathwayt, 1947). He located about 20 pairs, but probably considerably more bred or attempted to do so.

There is some evidence to suggest that the year of greatest



abundance in Britain since the early 1800's was about 1949. But the decline between 1949 and 1954, if it occurred at all, was slight.

In 1953 Sir William Taylor, a former Director-General of the Forestry Commission, organized a survey of Buzzards in all Forestry Commission forests in England and Wales. A rough estimate of abundance was obtained for each forest. (Officers were asked to state whether Buzzards were "numerous, not numerous, occasional or not known to be present" in their forests.) No distinction was asked for between breeding birds and migrants, nevertheless a good general picture of the position in 1953 was obtained. Sir William Taylor most generously lent the writer all the data obtained and suggested that they should be incorporated with that of the British Trust for Ornithology's Buzzard Survey. The data of his survey are accordingly summarized in Appendix I. Sir William Taylor's survey was most useful both in planning the 1954 British Trust for Ornithology's survey and providing a valuable independent check of the results of that survey.

In 1954 the British Trust for Ornithology's Buzzard Survey was begun for the reasons given in the introduction. The Survey showed conclusively that the species had regained more of its old range since 1939 and that over a large part of Western Britain it was once again the "commonest hawk we have".

The decline and subsequent recovery of the species is illustrated by the four maps in Fig 1. The dates of the maps were chosen for the following reasons:—

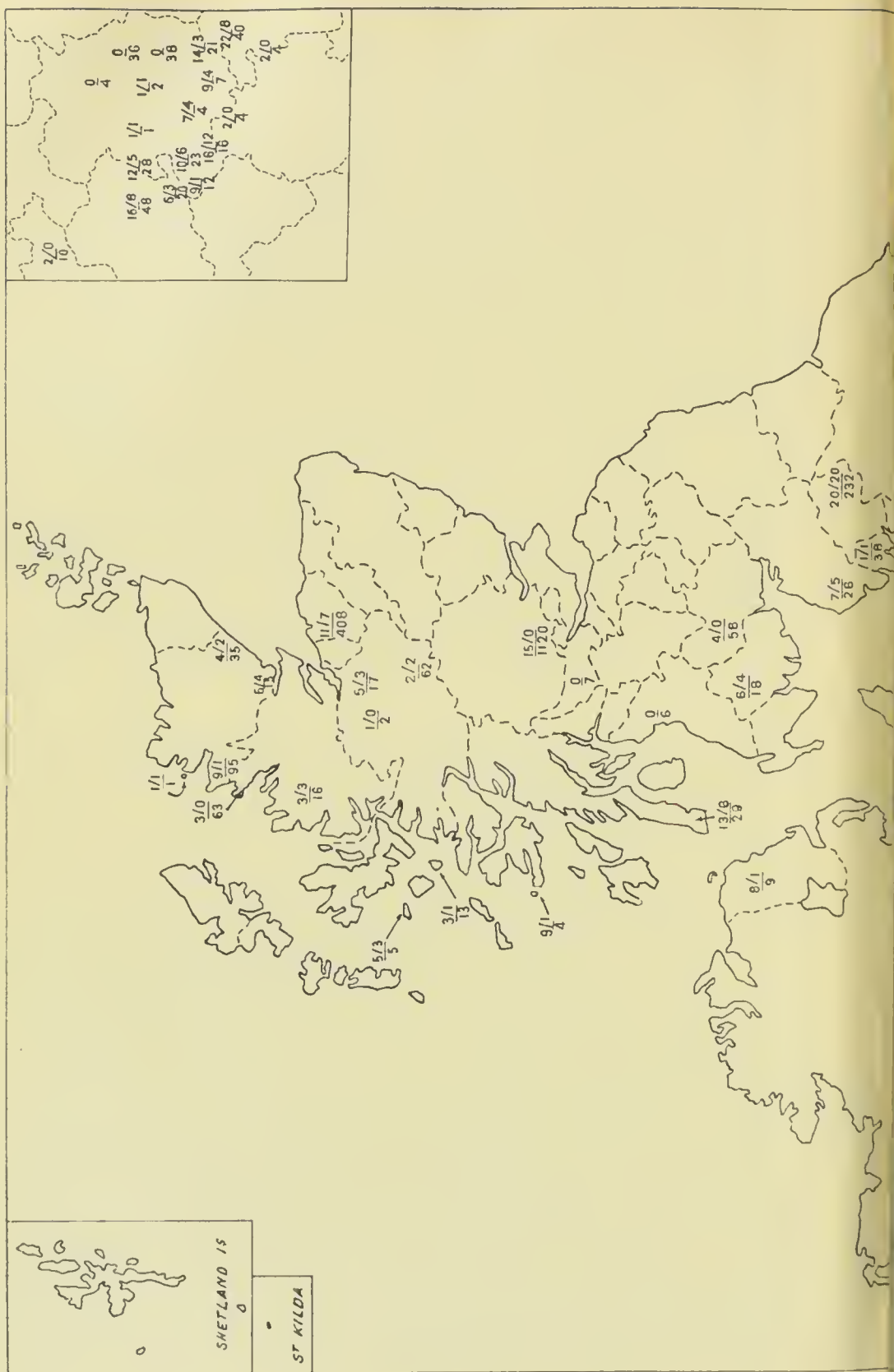
1800—because it was approximately the time of the first detailed ornithological observations. This was one of the last years in which the Buzzard was generally distributed in the British Isles.

1865—because it was the year of the publication of A. G. More's survey and a year of transition.

1900—because much can be discovered from the many county ornithologies and from the bird sections of the Victoria County Histories which were written at this time. It was the period when the Buzzard population of Britain was at its lowest.

1954—because it was the year of the British Trust for Ornithology's Buzzard Survey.

The main sources of information for the map data were the books and papers in the Alexander Library, Oxford; the Wiglesworth Library, Bristol; and the Witherby Library loaned to the Nature Conservancy, London. All relevant volumes in these libraries were examined. Most have been omitted from the bibliography in order to save space. Much of the evidence is circumstantial only. Wherever there is thought to be considerable doubt about whether the Buzzard was breeding in the county at the date given, a question mark is shown. In these doubtful



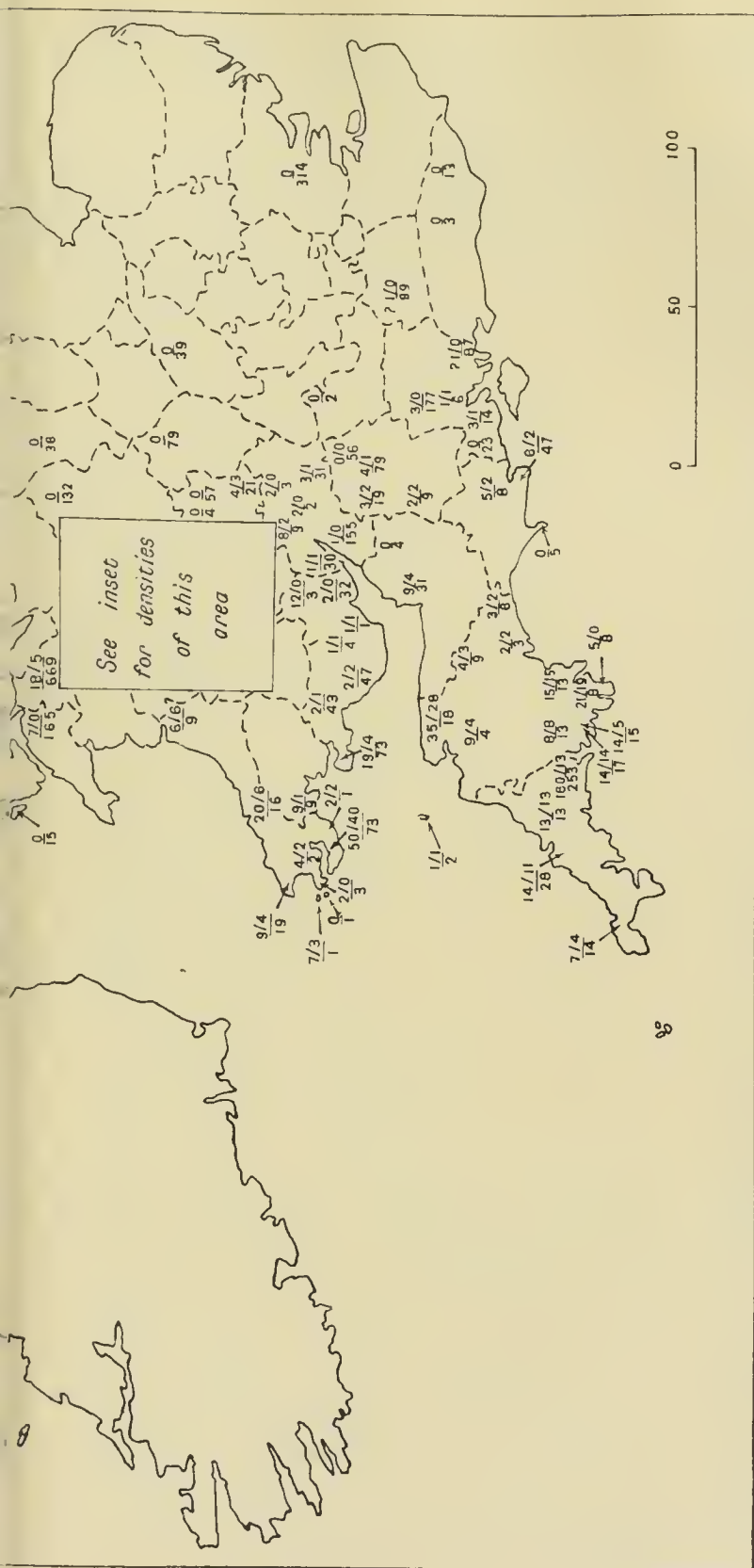


FIG. 2.—MAP SHOWING POSITIONS OF CENSUS AREAS AND THE NUMBER OF BUZZARDS (*Buteo buteo*) BREEDING IN THEM IN 1954 (Scale in miles)

The figures give the population densities: pairs of Buzzards/square miles.

e.g.  $\frac{7}{3}$  means that 7 pairs were believed to have bred, and the occupied nests of 4 pairs were found, in a census area of 15 square miles.

The position of the fraction, or the point of the accompanying arrow, gives a rough indication of the site of each census area. A few fractions represent the sum of adjoining census areas.



areas the shading merely indicates the opinion of the writer: black means Buzzards probably breeding, white Buzzards probably not breeding.

#### POPULATION-DENSITY

The question "Where were Buzzards to be found?" has been answered. An attempt to answer the question "How many?" is made in this section. There is little recorded information about the population-density of Buzzards in Britain before 1954. Most of the records refer to small islands. Those records known to the writer are given in Appendix II.

The true status of the Buzzard cannot be described unless something is known about the population-densities occurring throughout the country. One of the main aims of the Buzzard Survey was to discover the relative abundance of the Buzzard in different habitats and different parts of the British Isles. The contributors were asked to define their census-area and to record both the number of pairs which they estimated were breeding in it and the number they proved to be nesting. The data returned are shown in Fig. 2. The census-areas made a total of *ca.* 5,857 sq. miles. 810 pairs were estimated as breeding in this area and 363 nests were actually found; 142 non-breeding birds were also believed to be present. In addition, 357 pairs were reported outside the census areas; 63 of these were shown to be breeding.

The average breeding-density for the census-areas as a whole was 0.14 pairs of Buzzards per square mile (or 7.23 sq. miles to each pair of Buzzards). The median was a density of 0.3 pairs of Buzzards per sq. mile. As was to be expected, there was great variation in population-density from different parts of the country. The highest density recorded was 6.2 pairs per square mile (7 pairs in 722 acres) recorded by T. A. W. Davis on the Island of Skomer. Of the other 4 densities exceeding 2 pairs per sq. mile, one was in Monmouth (3.87) two were in Devon (2.6 and 2.3) and one was in Argyll (Iona—2.5). The figures suggest that 1 to 2 pairs per sq. mile is probably the normal maximum density in favourable habitats.

The data have been analysed for any correlation with longitude, latitude, or habitat (Fig. 3). As was to be expected, Buzzards are more numerous in the West than the East (Fig. 3A). There is no strong correlation with latitude (Fig. 3B), although there is some indication that population-density is less in the North than in equivalent areas in the South. Also, as was to be expected, most census-areas in which no Buzzards were recorded consisted of agricultural land. Nevertheless, the figures suggest strongly that purely agricultural country\*, or country which is part moorland and part agricultural, supports denser populations than does moorland and forest (Fig. 3C). The Buzzard can be quite common

\*For example in the South Hams region of Devon, South Pembrokeshire, North Dorset, part of Worcestershire, etc.

on the edges of large towns ,e.g. Plymouth (Devon). These points are worth emphasizing since there is a widely-held belief that the Buzzard is most at home in wild moorland.

The figures of the Buzzard Survey, supplemented by a large number of general observations by contributors, notably those of W. M. Condry, D. A. Ratcliffe, H. Morrey Salmon, P. W. Sandeman, and the writer, have been used as the basis for Fig. 4, which gives a crude appraisal of population-density in the British Isles on a county basis. Although there are some differences, it largely confirms the picture given by W. B. Alexander in the recently published volume V of the *Birds of the British Isles* (Bannerman, 1956).

#### DISCUSSION

##### 1. *The limiting factors.*

What determines the population-density of the Buzzard in Britain? In the parts of the country where it is rare, there is little doubt that its numbers are directly controlled by man (see p. 187). Buzzards are uncommon in those areas where there are not many crags or trees, even though there is also no game-preservation. The few nests are crowded together in the small available breeding-places (W. M. Condry records an exceptional case of 3 Buzzards' nests and 1 Kite's in a wood of 300 × 300 yards in Wales—personal communication). Although the prey-population of moorland is probably less than that of other habitats, the densities of breeding Buzzards in these particular moors are almost certainly limited by lack of nesting-sites rather than food-shortage. Elsewhere food and territorial behaviour are probably the limiting factors. This view is suggested by the fact that unusually dense Buzzard populations occur in places—mostly islands—where potential prey-species are particularly abundant.

##### 2. *The ecological status of the Buzzard in Britain to-day.*

In this section the ecological relationship between the Buzzard and other species is discussed. As a predator it must affect both its prey and its competitors for prey and nesting-sites. So little is known about the animal populations with which it interacts, that this discussion is of course, extremely speculative. The aim is to put the problem in perspective by using the density data now available. First, in order to indicate the order of the problem, the total Buzzard population is compared with that of other bird-species whose populations in Britain are approximately known. Secondly, its interactions with other prey and predator species are examined more closely.

The total census area of the 1954 Survey (5,857 sq. miles) covered about 1/15 of the total surface of Great Britain. Can it be taken as a reasonable sample of the whole of Britain? There are four main forms of bias connected with the questionnaire

system used:—

(1) In districts where Buzzards are uncommon but known to be present, observers probably tended to choose census-areas where they knew at least one pair of Buzzards was to be found.

(2) It is difficult to persuade ornithologists to cover areas which they believe contain no Buzzards. As a result the eastern half of Britain was less well covered than the western.

(3) The difficulties of estimating Buzzard populations in districts where they are abundant means that census areas in these districts tended to be smaller than census areas where Buzzards are rare or not present.

(4) Ornithologists are rare in most of the districts where the Buzzard is commonest, *i.e.* central Wales and the west coast of Scotland.

It is impossible to quantify these biases accurately, but since the effects of 3 and 4 would tend to cancel out those of 1 and 2, it seems reasonable to suppose that the census-areas in the aggregate made a fairly good sample.

If the sample is taken as a fair one it shows that the total population of Buzzards at the beginning of the breeding season in 1954 was *ca.* 12,000 breeding pairs with very approximately 2,000 non-breeders, *i.e.* a total population of 26,000 Buzzards. To give a reasonable margin of error—it is unlikely that the total Buzzard population in the British Isles in the spring of 1954 was less than 20,000 or more than 30,000.

The Buzzard is therefore about as numerous a bird as the Heron (*Ardea cinerea*) (31,000 old and young—computation from data of Nicholson, 1929, and Burton, 1956) and the Mute Swan (*Cygnus olor*) (20,000—B. Campbell, personal communication), but considerably rarer than the Fulmar (*Fulmarus glacialis*) (100,000 in 1949—Fisher and Lockley, 1954) and the Gannet (*Sula bassana*), and yet much more numerous than the Great Crested Grebe (*Podiceps cristatus*) (*ca.* 3,500—computation from data of Hollom, 1951). In distribution and past history the species it most resembles is the Raven (*Corvus corax*). The main difference is that the Raven nests commonly in Ireland and the Isle of Man. Its total numbers in the British Isles are probably not very dissimilar.

In the eastern half of Britain the Buzzard is a rare species and its effects on other species must be negligible, but in the west, particularly in those counties shown double cross-hatched in Fig. 4, it is one of the commonest predators.

To assess its rôle in these counties the general prey-predator pattern must be outlined. As in most of Britain, there are only about 9 common species of vertebrate predator which feed mainly on warm-blooded animals. These are the Adder (*Vipera berus*), Sparrowhawk (*Accipiter nisus*), Kestrel (*Falco tinnunculus*), Buzzard, Tawny Owl (*Strix aluco*), Domestic



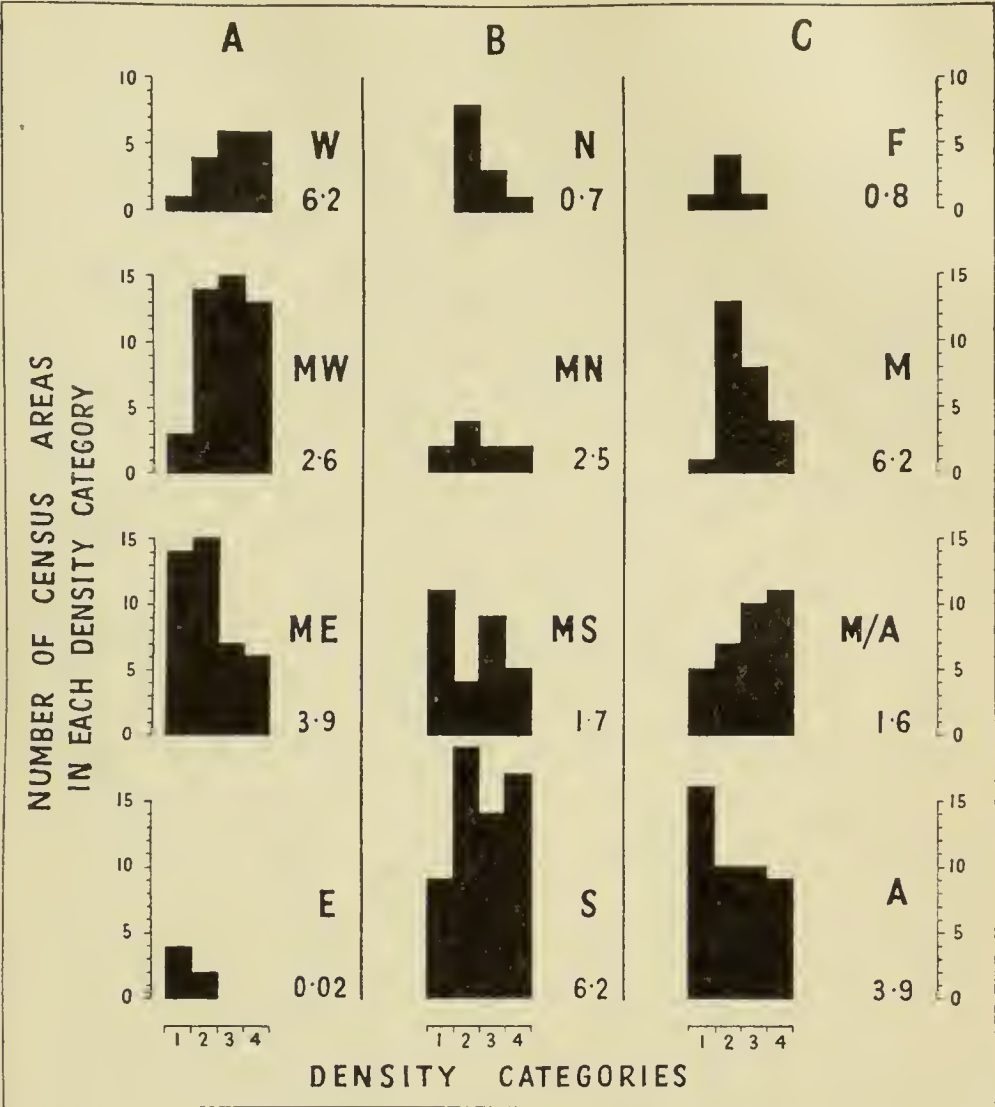


FIG. 3—ANALYSIS OF POPULATION DENSITIES OF BREEDING BUZZARDS (*Buteo buteo*) IN THE BRITISH ISLES IN 1954

A. Correlation with Longitude.

- W — Western quarter of Buzzard's range.
- MW — Mid-western " " " "
- ME — Mid-eastern " " " "
- E — Eastern " " " "

B. Correlation with Latitude.

- N — Northern quarter of Buzzard's range.
- MN — Mid-northern " " " "
- MS — Mid-southern " " " "
- S — Southern " " " "

C. Correlation with Habitat.

- F — Forest.
- M — Over 75 per cent Moorland.
- M/A — Not less than 25 per cent Moorland and not less than 25 per cent Agricultural
- A — Over 75 per cent Agricultural.

For all figures.

Density category:—

- 1 = 0 Buzzards per square mile.
- 2 = 0.01 to 0.29 Buzzards per square mile.
- 3 = 0.3 to 0.69 " " " "
- 4 = 0.7 to 6.2 " " " "

(Each category includes about 1/4 of the "census" records).

The unit is the census area whatever its size. The highest densities recorded for each histogram are shown to the right in each case.

Cat (*Felis* sp.), Fox (*Vulpes vulpes*), Stoat (*Mustela erminea*) and Weasel (*Mustela nivalis*). In addition, there are two omnivores, Badger (*Meles meles*) and Man, and the mainly insectivorous Little Owl (*Athene noctua*), which also take a large amount of vertebrate prey. These species make up the basic vertebrate predator pattern in Britain. The Buzzard is unlike the others in that it is now confined to the western half of the country. All these predators (except Man) feed on a mixed diet which may include Rabbits, small rodents and insectivores, birds and invertebrates. But all the species differ in the proportions eaten: as regards vertebrate food, the Buzzard, Fox (Badger and Man) are primarily Rabbit-eaters, the Sparrowhawk (and Little Owl) bird-eaters, and the rest feed principally on small mammals. The data of the Buzzard Survey (unpublished) show that Buzzards feed on a very wide range of food and suggest that there is very great local and individual variation; also that the species is adaptable in its feeding-habits. It seems that in general, and within their normal food range (Tipulid to young Rabbit), they eat what is available.\* It is therefore unlikely that alone the Buzzard population controls the populations of any of its prey-species. But there is evidence (Buzzard Survey, unpublished) that if the total prey-population is much reduced, as happened as a result of Myxomatosis, there is strong inter-specific competition which affects not only the population of Buzzards and those of its wild competitors, but also the remaining prey-populations. In districts where the Buzzard is abundant, it appears to be much the commonest bird of prey—distinctly commoner than the Kestrel (Hurrell, 1929, and Buzzard Survey unpublished data), although taking the country as a whole, the Tawny Owl, Little Owl, Kestrel and the Sparrowhawk are probably more numerous. No population figures are available for the predatory Mammal populations (other than Man) or for the Adder, but under optimal conditions the density of all of them is almost certainly higher than that of the Buzzard.

The nesting-habits of the Buzzard resemble those of the Raven. Both nest in crags and trees and occasionally on the ground. There is some evidence to show that Buzzards and Ravens compete for nesting-sites. (There is also perhaps some competition between these species for carrion.) They are often seen fighting.

The Kite probably competes with the Buzzard for food. Also they compete for nesting-places (the Kite usually winning?). Nevertheless, the Buzzard is extremely common in the Kite country to-day (W. M. Condry, personal communication).

J. C. Bellamy (1839) stated that in South Devon the Moor Buzzard (*i.e.* Marsh Harrier) was commoner than other kinds of

\*Like the Long-eared Owl (*Asio otus*) (Tinbergen, 1933) and the Tawny Owl (Southern, 1954).

buzzard and was chiefly found on Rabbit-grounds. To-day the Buzzard occupies both its old and the Marsh Harrier's territory. If the latter should ever return to breed in any large numbers in Western Britain, it will be interesting to watch the effect on the Buzzard.

Abroad the Buzzard occurs at high densities in company with other species (1.8 per square mile, 1955, Baden, Germany—D. Sengler, personal communication; 0.6 pairs per square mile, 1952, Brandenburg, Wendland) and doubtless did so in Britain 150 years ago. Compared with other species of predatory bird, the Buzzard appears to occupy an intermediate density position: between the Golden Eagle (*Aquila chrysaetos*) which needs *ca.* 16 square miles of territory (Darling, 1947) and the Tawny Owl that needs only about 50 acres ( $1/13$  square mile) (Southern, 1954). This seems to be true of the genus as a whole, for Stewart (1949) records a density of 1.2 pairs per square mile for the Red-shouldered Hawk (*B. lineatus*) in Maryland, U.S.A., and Southern (1955) one of 0.4 pairs per square mile for the Rough-legged Buzzard in a good vole year (1937, Abisko, Sweden).

To conclude, the Buzzard population is probably limited by different factors in different parts of its range—by human predators, by availability of nesting-sites and of food, and by its territorial behaviour (see p. 183). But it is catholic and adjustable in its feeding- and nesting-habits. It is a generalized "un-specialized" species. As such it appears to be well adapted to a world in which habitats change rapidly. And as such the Buzzard alone is unlikely to have a marked effect on any one of its prey-species or on any predator-species with which it may compete. But it is so common in Western Britain that it must form an important element in the total predator-population.

The species which affects it most is its fellow but much more numerous predator, Man. In the next section the ups and downs of the Buzzard population are connected with human activities.

### 3. *The causes of population changes in the past.*

What were the causes of the decline of the Buzzard population from 1800 to about 1915 and its increase from 1915 to 1954? Important changes in the environment occurred during these 150 years. But since the changes from country to town were most marked during the period of increase, urbanization clearly cannot be invoked. Decrease and increase occurred both in times of agricultural prosperity and slump: the changes cannot be attributed to agricultural practice. There is only one major factor which can be correlated with the changes in the Buzzard population—game-preservation. Game-preservation was increasingly practised from 1800 to 1914—the time of decrease. In the two wars (the times of greatest increase) there was very little game-preservation, and between the wars when there was less game-preservation than before the first war, there was a slow increase. Not only



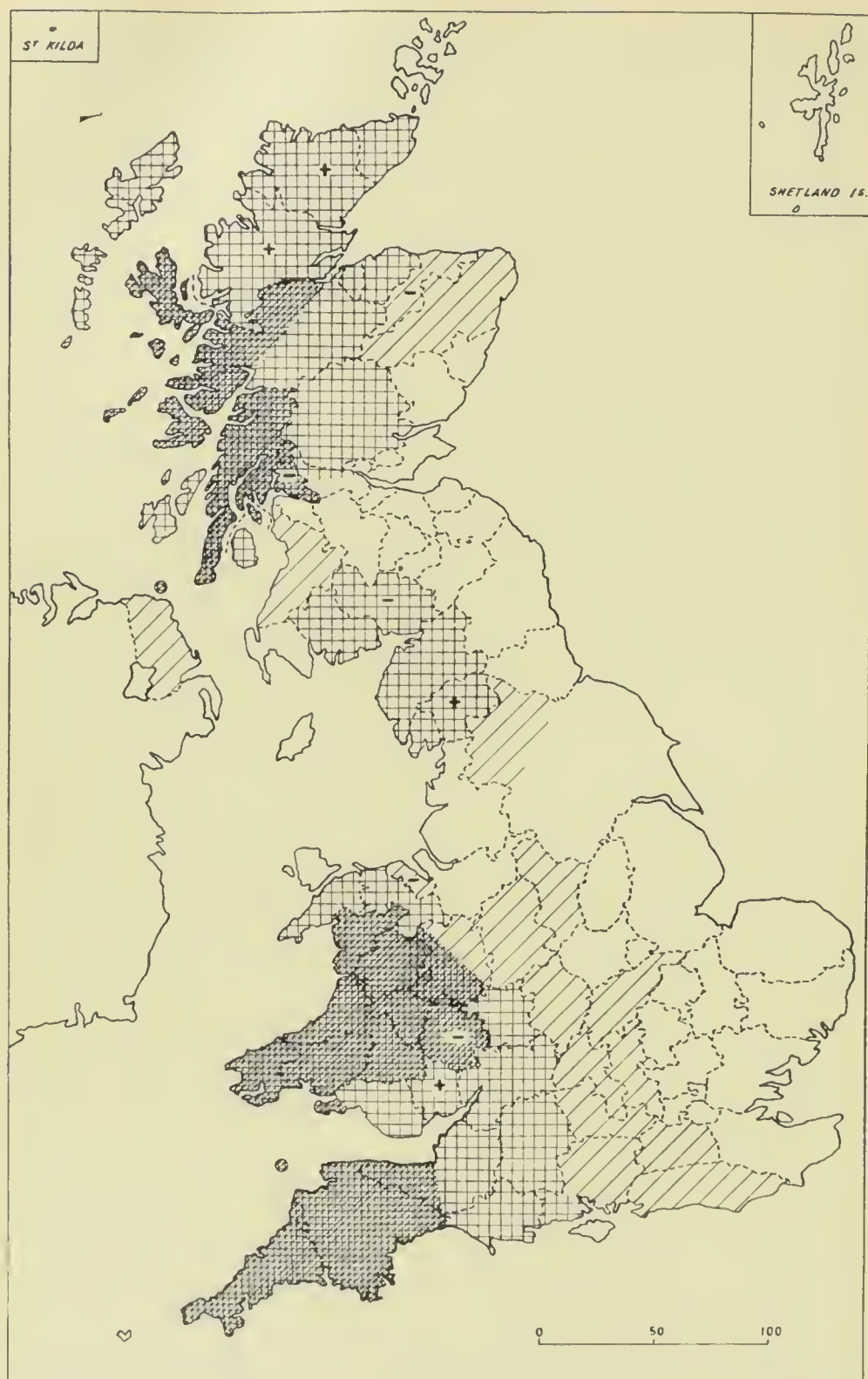


FIG. 4—THE BREEDING POPULATION DENSITY OF THE BUZZARD (*Buteo buteo*) IN THE BRITISH ISLES IN 1954

Highest density occurs in areas shaded darkly (for key see page 190).  
Scale in miles.

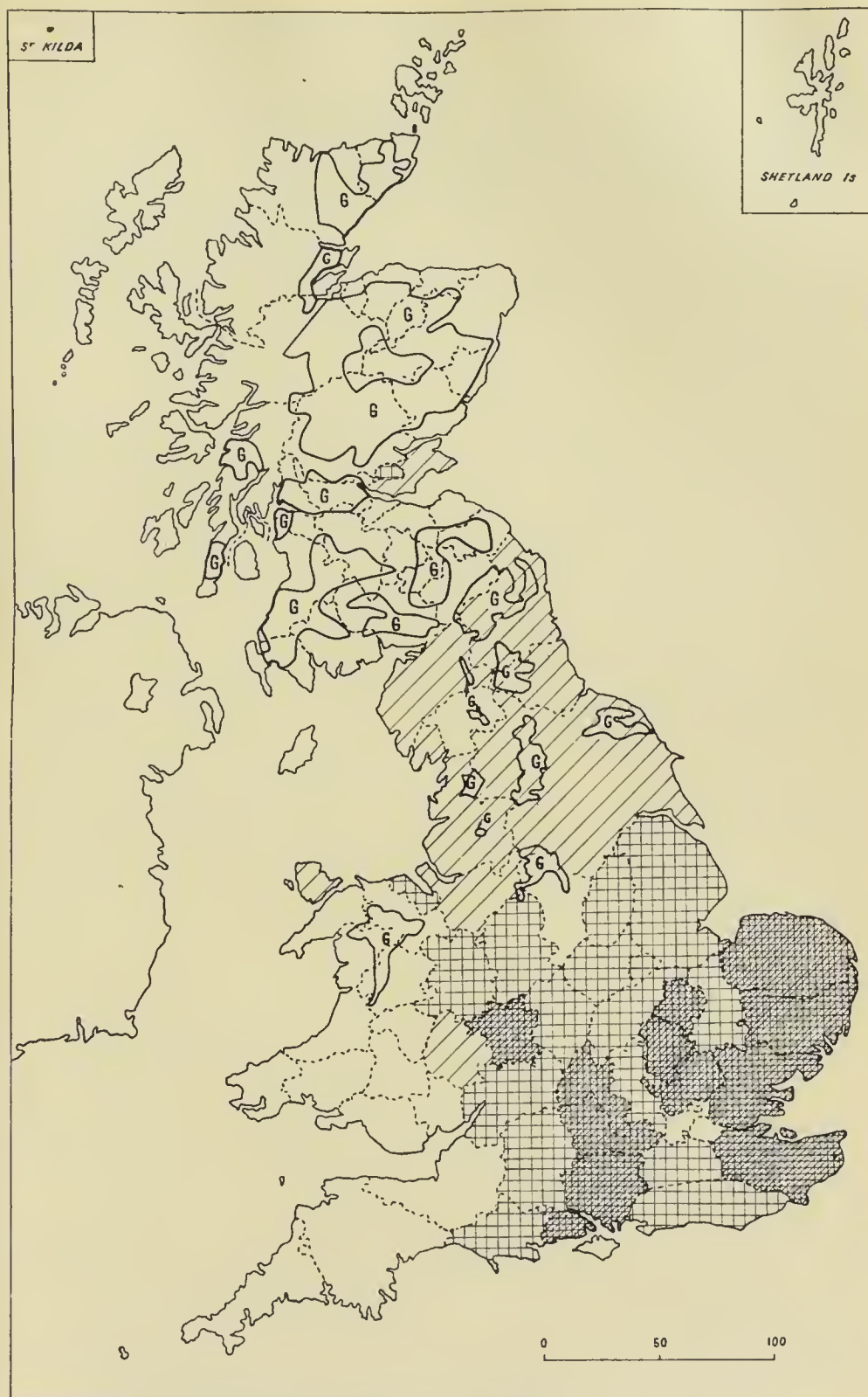


FIG. 5—GAME-PRESERVATION IN THE BRITISH ISLES IN 1955

Most game-preservation occurs in shaded areas and areas marked "G" (for key see page 191). Scale in miles.

is there a correlation in time but also in space. Buzzards are absent or rare in all those districts where game-preservation is most practised (see Fig. 5.). Enquiries have shown that the Buzzard is greatly persecuted by gamekeepers from North Scotland to Devon—the writer heard of over 400 being shot in three quite small areas in the winter of 1955.\*

Collectors undoubtedly added to the toll, but the Buzzard was probably never a rare enough species to be greatly affected by them. The increases or decreases in collecting were exactly parallel to those of game-preservation and probably merely helped to emphasize the trends produced by game-preservation.

#### 4. *The present and the future.*

In the past, the amount of game-preservation has largely determined the distribution and population-size of the Buzzard. Since 1954 the situation has been complicated by the introduction of Myxomatosis into nearly every part of the British Isles.

The results of the 1955 and 1956 British Trust for Ornithology's Buzzard Surveys can be tentatively summarized as follows:—

(1) 1955 showed a great decrease in breeding-activity of Buzzards in all regions where Rabbits had become rare or extinct. Many, perhaps most, pairs did not breed at all. It was normal, *i.e.* comparable to 1954, in local areas where the Rabbit-population was not affected, and where Rabbits had never been abundant.

(2) In 1956 there was much less breeding than in 1954 but about twice as much as in 1955.† The Buzzard population was

\*The case of the Buzzard, which has been protected by law since 1880, is a good example of the impotence of the law if it is not backed by public opinion.

†A detailed comparative analysis of these Surveys and the factors involved will be made elsewhere.

FIG. 4

KEY: Double cross-hatch	—	Average breeding density of Buzzards = 1 or more pairs per 10 square miles.
Cross-hatch	—	Average breeding density of Buzzards = more than 1 pair per 100 square miles, but less than 1 pair per 10 square miles.
Diagonal hatch	—	Average breeding density of Buzzards = less than 1 pair per 100 square miles.
White	—	No breeding Buzzards.

The densities are marked out for counties except as where otherwise indicated (*i.e.* in Ross and Cromarty, Inverness, Stirling, Argyll, Bute, Lancashire, Yorkshire, Shropshire, Glamorgan, Somerset, and Hampshire).

- + means that the breeding density may belong to the category higher than that indicated.  
 — means that the breeding density may belong to the category lower than that indicated.



distinctly smaller than in 1954. The decline appears to be due to two main causes:—

(a) Food shortage.

(b) A change in the human attitude to the Buzzard. It has been widely assumed by poultry-farmers and shooting men that the Buzzard's depredations on poultry and game would increase when Rabbits became scarce. They have acted on this assumption by shooting more Buzzards.

As far as food is concerned, the Buzzard would presumably be able to adapt itself—for it exists at high densities in parts of Europe where there are no Rabbits (Sengler, personal communication; Wendland, 1952; Uttendörfer, 1939, 1952). But one would expect a lower density to result because the total prey-biomass has presumably decreased and many of the suitable alternative prey-animals of Europe (*e.g.* *Microtus arvalis*) are not found in Britain (see Uttendörfer, 1939, 1952). The results of the 1956 Buzzard Survey suggest that the Buzzard population has in fact reacted quickly and is becoming reasonably stable again at a lower density (unpublished data). Whether Buzzards are beneficial or not, is from the present standpoint much less important than whether they are believed to be destructive.

Some Buzzards sometimes take young game-birds and chickens, and these instances, together with false rumours, are sufficiently numerous to prejudice most game-preservers and poultry-farmers against the species as a whole. To prove whether the Buzzard is an economic asset or debit will need a much greater knowledge of British wildlife than is yet available. Meanwhile, game-keepers are more likely to be swayed by tradition and the

FIG. 5

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KEY: Double cross-hatch	— 3-6 gamekeepers per 100 square miles (see note).
Cross-hatch	— 1-2 gamekeepers per 100 square miles.
Diagonal hatch	— 1 gamekeeper or more per 200 square miles but less than 1 gamekeeper per 100 square miles.
White	— Less than 1 gamekeeper per 200 square miles.

Note: These figures were kindly supplied by Major A. W. Neve, Secretary of the Gamekeepers' Association. They are relative, not absolute: they are based on membership of the Gamekeepers' Association, not on total numbers. Major Neve states that they give a fairly reliable picture of the situation south of the Border. They cease to be reliable where estates are very large. These are mainly in Red Grouse (*Lagopus scoticus*) shooting-areas. Therefore the principal grouse-preserving areas "G" have been superimposed on the map. These should be noted in conjunction with the pattern of gamekeeper-density. The positions of the principal grouse-preserving areas are partly based on Leslie & Shipley (1911) and partly on information supplied by County Pest Officers and others.

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occasional misdeed of a Buzzard—real or imaginary—than by ecological theory. It is likely that present conditions and attitudes will continue for some time. If they do, it is improbable that the species will become common in the east of the country however suitable the habitat remains in those parts. On the other hand, the Buzzard is likely to continue to be a very common species in the sheep-walks and forests of the west and in agricultural country where, because there is little game-preservation, it is tolerated or only mildly persecuted. Whether the Rabbit becomes a pest again or not will be a minor factor. The future of the Buzzard in Britain will depend, like its past, on the opinions of those who preserve game.

#### SUMMARY

1. The Buzzard (*Buteo buteo*) was generally distributed throughout the British Isles in the early 19th century and was a very common species.

2. Thereafter it declined until at the outbreak of the 1914-18 war it was confined to the extreme west of Great Britain. It was a rare species except in central Wales and parts of western Scotland, the Lake District and the Devonian peninsula.

3. Since the first world war it has regained much of its old range, and has recolonized Ireland. In large areas of the western half of Britain it is probably the commonest bird of prey.

4. In 1954, 5,857 square miles (15,171 sq. km.) were surveyed by the contributors to the British Trust for Ornithology's Buzzard Survey. 810 pairs were estimated as breeding in this area (357 nests were found). From this and other data of the Survey it is estimated that the total population of Buzzards in the British Isles in the spring of 1954 was between 20,000 and 30,000 birds.

5. The average breeding-density for all the census areas was 0.14 pairs of Buzzards per square mile (0.05 per sq. km.), the median figure being 0.3 pairs of Buzzards per square mile (0.1 per sq. km.). The highest density recorded was 6.2 pairs per square mile (2.4 per sq. km.). Normal maximum density was about 1 to 2 pairs per square mile (0.4 to 0.8 per sq. km.).

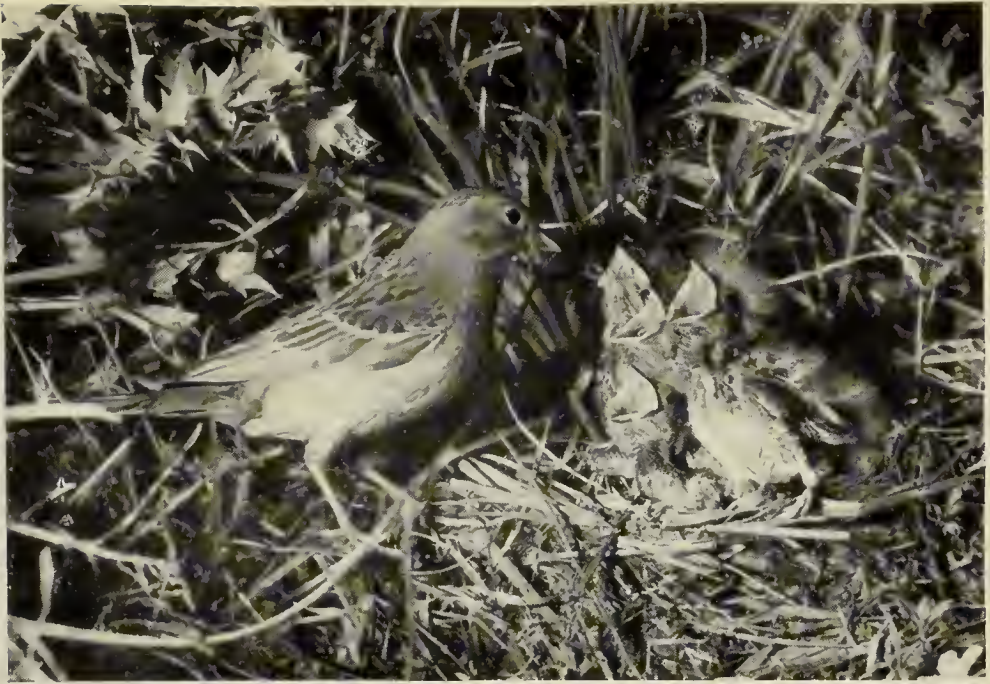
6. Breeding-densities were higher in the west of Britain than the east.

7. High breeding-densities occurred more frequently in agricultural country or mixed moorland and agricultural country than in moorland or forests.

8. Buzzard populations are limited by human persecution, availability of nesting-sites and of food, and by territorial behaviour, according to district.

9. The Buzzard is a generalized species. It is unlikely to "control" the populations of any one of its prey or competitors.





K. Koffán

MALE ORTOLAN BUNTING (*Emberiza hortulana*) AT NEST

This shows the position of a typical nest, on the ground and hidden at the base of fairly thick vegetation. Both sexes attend the young, but the female alone builds and incubates, while the male mounts guard on a prominent perch near-by (see page 197).



K. Koffán

FEMALE ORTOLAN BUNTING (*Emberiza hortulana*) FEEDING YOUNG

BUDAÖRS, HUNGARY, 15TH JUNE 1952

This gives an illustration of the bold pattern of dark streaks and lightish markings on the upper-parts ; when seen from behind, these markings form an inverted horseshoe-shaped area and contrast with the distinctive warm buff rump (see page 199).





MALE ORTOLAN BUNTING (*Emberiza hortulana*) FEEDING YOUNG: BUDAÖRS, HUNGARY, 15TH JUNE 1952  
K. Koffán  
In summer plumage the males have a distinctive greenish-grey head and breast, yellow throat, and moustachial stripe, and warm rufous under-parts, the female being paler, duller and less green; both sexes have a bright pink bill. This photograph also shows fairly well the striking eye-ring or "spectacle". This pair never flew directly to the nest, but like many ground-breeding species walked to and from it (see page 200).



K. Koffán

FEMALE ORTOLAN BUNTING (*Emberiza hortulana*) AT NEST: BUDAÖRS, HUNGARY, 15TH JUNE 1952  
 Unlike many females in summer, this bird has little trace of a light eye-ring, but the photograph shows well the neat pattern formed by the light edgings to the wings-feathers, and the bird's flat forehead which, with the pale deep-based bill and the large dark eye, gives it a curious facial expression. These are useful characters at all seasons. The clutch normally consists of 4-5 eggs, sometimes 6, and there were four young here; they were fed entirely on insects.





*Angela Davis*

JUVENILE ORTOLAN (*Emberiza hortulana*): SKOKHOLM, 12TH SEPTEMBER 1956  
The juvenile lacks the green, yellow and pinkish colouring, so that call-note, back-pattern, buff rump, pale bill, white outer webs (as well as inner) to outer tail, and sometimes the eye-ring, are the best characters (but see pages 199, 206 and vol. xlix, pp. 330-331).



*o 16*

*Drawn by P. J. Hayman*

LITTLE BUNTING (*Emberiza pusilla*): BEDDINGTON, SURREY, MARCH/APRIL 1956  
This sketch of the duller of the three seen (pages 206-208) shows how the normally striking head-pattern is less marked in some individuals. This bird's head was mainly greyish-brown, with the black stripes bordering crown and cheeks much reduced, the chestnut colour less noticeable, the superciliary cream, and the breast streaks browner and fainter.



But it is so common in the west that it is probably an important element in the total 12 species predator-force.

10. The changes in the Buzzard population are closely correlated with the fortunes of game-preservation both in time and space.

11. The future of the species in Britain is discussed.

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APPENDIX I—BUZZARDS (*Buteo buteo*) IN THE FORESTRY  
COMMISSION'S FORESTS, 1953

(see page 179)

County	Total number of Forests in each County	Number of forests in each category			
		Numerous	Not Numerous	Occasional	None
COUNTIES IN WHICH HIGHEST CATEGORY RECORDED WAS "NUMEROUS"					
Brecon	13	6	7	0	0
Caernarvon	6	1	3	2	0
Carmarthen	7	5	1	1	0
Cardigan	5	5	0	0	0
Cornwall	6	2	1	2	1
Cumberland	8	1	2	4	1
Devon	9	6	3	0	0
Dorset	5	1	1	3	0
Hereford	5	3	0	2	0
Merioneth	9	5	3	1	0
Montgomery	6	5	1	0	0
Pembroke	1	1	0	0	0
Radnor	2	2	0	0	0
Shropshire	5	1	3	1	0
Somerset	7	1	2	4	0
Surrey	4	1*	0	1	2
COUNTIES IN WHICH HIGHEST CATEGORY RECORDED WAS "NOT NUMEROUS"					
Denbigh	5	0	3	2	0
Glamorgan	13	0	3	7	3
Gloucester	15	0	4	5	6
Hampshire	27	0	9	10	8
Lancashire	2	0	1	1	0
Wiltshire	6	0	1	5	0
COUNTIES IN WHICH HIGHEST CATEGORY RECORDED WAS "OCCASIONAL"					
Anglesey	2	0	0	2	0
Derby	2	0	0	1	1
Durham	3	0	0	2	1
Essex	2	0	0	1	1
Isle of Wight	2	0	0	1	1
Kent	7	0	0	1	6
Monmouth	8	0	0	6	2
Norfolk	5	0	0	2	3
Northampton	2	0	0	1	1
Northumberland	14	0	0	7	7
Stafford	4	0	0	2	2
Sussex	15	0	0	6	9
Warwick	2	0	0	1	1
Westmorland	2	0	0	2	0
Worcester	2	0	0	1	1
Yorkshire	17	0	0	9	8
COUNTIES IN WHICH HIGHEST CATEGORY RECORDED WAS "NONE"					
Bedford	1	0	0	0	1
Berkshire	2	0	0	0	2
Buckingham	1	0	0	0	1
Cheshire	1	0	0	0	1
Hertford	1	0	0	0	1
Leicester	1	0	0	0	1
Lincoln	1	0	0	0	1
Nottingham	4	0	0	0	4
Oxford	1	0	0	0	1
Suffolk	1	0	0	0	1

\*This report from Surrey is almost certainly of very local application.

APPENDIX II—POPULATION DENSITIES OF BREEDING  
BUZZARDS (*Buteo buteo*) RECORDED BEFORE 1954

Date	Authority	Locality	Pairs of Buzzards	Pairs of Buzzards per sq. mile
1848	St. John (1884)	Sutherland	8	0.03
1922	Lloyd (Wynne-Edwards & Harrison, 1932)	Lundy	2	1.2
1930	Wynne-Edwards & Harrison (1932)	"	4	2.4
1929	Hurrell (1929)	N. Devon	21	0.3
1929	" "	S. Devon	25	0.1
1929	" "	Cornwall	7	0.2
1933	Baxter and Rintoul (1953)	Eigg	5	0.4
1933	" " " "	Canna	4-6	0.8-1.2
1948	Joint Schools Expedition	"	10-13	2.0-2.6
1936	Baxter and Rintoul (1953)	Raasay	5-6	0.2-0.3
1938, '46, '47, 1949-51	Davis (personal communication)	Skokholm	1	2.0
1948	" " "	"	2	4.0
1939	Bolam and Blezard per Ratcliffe (personal communication)	Cumberland	12	1.3
1947	Cadman (personal communication)	Central Wales	22	1.7
1947	B. Campbell (personal communication)	Iona	2	0.5
1947	Darling (1947)	Lunga (Treshnish)	3	4.0

## PHOTOGRAPHIC STUDIES OF SOME LESS FAMILIAR BIRDS

### LXXXI. ORTOLAN BUNTING

Photographed by K. KOFFAN

(Plates 33-35)

ALTHOUGH only a vagrant in Britain, the Ortolan Bunting (*Emberiza hortulana*) has a wide distribution in the Palaearctic region, breeding in most parts of continental Europe from Spain in the south to the arctic circle in the north, and in south-west and central Asia as far east as western Mongolia. It is a summer-visitor, wintering almost exclusively in Africa north of the Equator, only a few remaining in the south of Europe. It has no subspecies, but in the south its breeding-range overlaps those of two similar and closely-related species, *E. buchanani* in Persia and Turkestan, and *E. caesia* in Greece and Asia Minor. Notwithstanding its distant and restricted breeding-range, the latter species, known as Cretzschmar's Bunting, might just conceivably occur in Britain, for it was at one time recorded as a fairly regular spring-visitor to Heligoland.

The Ortolan Bunting has a curious distribution in Europe, being common in the Mediterranean area (where it has gained an unenviable reputation for gastronomic excellence) and also in Sweden and Finland, but considerably less numerous in intervening areas. It is, for example, absent from north-west France, Denmark and the westernmost bulge of Norway, and decidedly local in north-east France, Switzerland, Belgium, Holland and north Germany. In the last twenty years, however, it has been extending its range in these countries and has increased considerably in numbers, probably due to climatic changes, but doubtless also in part to the recent prohibition of trapping in France and Belgium. J. Spaepen (1952, *Gerfaut*, vol. 42, pp. 164-214) has recently summarized its distribution in Europe, and gives also an interesting account of its migration, including an account of field-observations in Belgium and a list of ringing-recoveries. So far there has been only one recovery of a bird from Scandinavia, a nestling ringed in Finland and recovered in its first autumn in northern Italy. This, however, is of particular interest, as it suggests that the northern-breeding Ortolans follow a rather more easterly route in autumn than some other species which breed in the same area, and thus keep well away from the British Isles. Nevertheless, a few are recorded each year in Britain, either in May or in late August or September, and it is in fact one of the commonest of the rarer Continental "drift-migrants" on the east coast, sharing this distinction with the Bluethroat (*Cyanosylvia svecica*), a species of somewhat similar distribution. It is most numerous on Fair Isle, where as many as 15 were seen in May 1952 (*antea*, vol. xvi, p. 424), but occurs fairly frequently along the whole of the east coast of England and Scotland and, more rarely, on the south coast. It is again fairly regular on the islands in the Bristol Channel area, occurring annually on Lundy, and less frequently on Skokholm (where Mrs. Angela Davis's photograph reproduced on plate 36 upper was taken in 1956), but is otherwise rare in the west, and there are only three records for Ireland. But for its elusive behaviour and undistinctive autumn plumage it would doubtless be recorded much more frequently.

In spring the male Ortolan (plates 33 upper and 34) is a distinctive bird, with an unmistakeable greenish-grey head and breast, set off by warm rufous under-parts, a yellow throat and moustachial stripe, a bright pink bill and a startling yellow eyering or "spectacle". In this plumage it could hardly be confused with any other European species except Cretzschmar's Bunting, which has a similar plumage-pattern, but a bright bluish-grey head and orange throat. Females are less brightly coloured and often lack some of these characteristics—plates 33 lower and 35, for example, show a bird with little trace of the celebrated "spectacle"—but are usually distinctive enough: it is the juveniles in autumn which present the greatest difficulties (see *antea*, vol. xlix, pp. 330-331). Although some autumn birds—such as that



illustrated in plate 36 upper— still show a prominent eye-ring, in the majority of juveniles this is reduced or lacking and the colours are obscured by brown tips to the feathers, while the distinctive pink colour of the soft parts is often slow in developing. Such birds must be identified by more subtle characteristics, of which two are well shown in the photographs. Plates 33 and 35 illustrate the neat patterning of the mantle and wing-feathers which is a noticeable feature at all ages, while plates 35 and 36 upper show particularly well the flat forehead and the pale, deep-based bill, which in conjunction with the large dark eye give the bird a mysterious, staring expression which is very characteristic. Once the bird is known, however, it is much more readily identified by its call-note, a high “tlip” or “pwt” with a distinctive soft and liquid quality. Autumn migrants are usually difficult to observe, sometimes skulking in cover, and at other times wild and shy, perching high and flying far when only slightly disturbed.

In summer the Ortolan Bunting occurs in a wide variety of habitats, ranging from Mediterranean scrub through all kinds of waste ground to alpine pastures and clearings in northern forests. At least in northern Europe, however, it is characteristically a bird of cultivation, and is particularly associated with cornfields, frequently nesting in the growing corn and feeding in the stooks and stubbles after the harvest. Its habitat requirements have recently been discussed by S. Durango (1948, *Alauda*, vol. 16, pp. 1-20), by H. Bruns (1951, *Orn. Abhandl.*, No. 12) and by P. Géroutet (1954, *Nos Oiseaux*, vol. 22, pp. 217-225). It appears that it needs not only a warm dry summer climate with open ground available for feeding, but also an adequate supply of high perches, and enough cover to hide the nest without being too thick to allow the birds to approach it on foot. This combination of requirements doubtless accounts in part for its broken distribution in Europe, and for its curious patchiness even in areas where it is common; another important factor is probably its association with agriculture, for it has probably colonized much of the northern part of its range in comparatively recent times, after the clearance of natural forests and the drainage of marshes— processes which are still continuing.

Mr. Koffán's excellent photographs were taken in Hungary, and illustrate well the nesting habits of the species. The nest is nearly always on the ground (only two out of 102 nests described by Durango were not), and is usually well hidden under thick vegetation. It is rarely built more than fifty yards from some prominent perch which is occupied by the male during incubation, and used by the female as a look-out post on her journeys to and from the nest. Mr. Koffán's nest contained four young, but clutches of five appear to be the most frequent, at any rate in southern and central Europe, while clutches of six are not rare. It is a late breeder, nesting from mid-May onwards in central Europe, but mainly in early June in the north, and normally has only one

brood, although second clutches are not infrequently recorded in Germany. Géroutet (1951, *Nos Oiseaux*, vol. 21, pp. 1-6) describes a curious incident in which a female Ortolan apparently removed all her young from the nest immediately after they had been ringed, abandoned them and at once started to build a new nest.

I. C. T. NISBET

#### ADDENDUM

As we were about to go to press, we received a letter from Mr. Koffán with whom we had lost touch in recent months. Commenting on Mr. Nisbet's statement that in the last twenty years the Ortolan Bunting has been extending its range, he tells us that this agrees with his observations in Hungary, particularly in the hills of Budaörs, near Budapest, where his photographs were taken. During the last 10-12 years the Ortolan's range has been continually widening there, "though in some of their traditional places the density has not increased". Moreover, it is also noteworthy that recently this bird has frequently been found in vineyards, and particularly in the shrubby, rocky areas surrounding such places. On one occasion Mr. Koffán found a nest in a hawthorn (*Crataegus oxyacanthoides*) about 20 cm. (= 8 inches) above the ground, but most nests are actually on the ground in quite a variety of sites. For example, he has found a number of nests in thick grass in clearings in coniferous woods (the nest shown in these photographs comes into this category); others among dense shrubs on a hill-slope facing south; and on rocky slopes covered with *Clematis vitalba*, facing east. In 1956 he found a nest with three young on one of the highest tips of the hills of Budaörs, about 1150 feet above sea level, on a steep rocky slope almost without vegetation, facing north-west, the nest being well built into the slope under a piece of stone. Another nest in 1956 was in a similar place on the flat side of an old quarry, facing south-east, deeply in under what was perhaps equivalent to about 3 cwt. of rock. In Hungary the Ortolan generally lays 4-5 eggs, and Mr. Koffán has only once found a nest with 6 and once one with 3.

The Ortolan generally arrives in the hills of Budaörs in the second half of April. Thus Mr. Koffán saw the first ones in 1951, 1952 and 1953 on 18th and 19th April; in 1949 on 28th April; and in 1954 on 1st May. They are seen in pairs a few days after their arrival. In favourable weather nesting usually starts in the first half of May; and there are sometimes two broods. The pair shown in the photographs were very shy: they spent a long time sitting or walking on the branches of surrounding trees before flying to the nest, giving short anxious cries which might well be mistaken for the calls of breeding Rock Thrushes (*Monticola saxatilis*). They never flew directly to the nest, but like many other terrestrial birds walked to and from it. They fed their young entirely on insects.

I. J. F.-L.

# FIELD-NOTES ON SOME BIRDS OF SOUTH-EAST EUROPE

By I. C. T. NISBET and T. C. SMOUT

THESE notes are compiled from field-observations made by the writers in south-east Europe in the autumn of 1956. We travelled via Venice and the Adriatic (28th August-2nd September), through Greece (Athens, 3rd-5th September; Delphi, 6th-8th September) to Turkey (Izmir, 10th September; Dardanelles region and Sea of Marmara, 11th and 22nd-26th September; Bosphorus area, 12th-21st September and 27th September-1st October). The notes are intended to confirm and extend the remarks made on field-identification in *The Handbook* (Witherby *et al.*, 1938-41) and the *Field-Guide* (Peterson *et al.*, 1954): they are mainly confined to those species which the western ornithologist usually has little opportunity to study. It should be stressed that the notes refer to autumn plumages only; where comparisons are made between similar species it is emphasized that these are only valid if the observer has experience (and recent practice) of at least one of the species involved.

LEVANTINE (MANX) SHEARWATER (*Procellaria puffinus yelkouan*).—All the thousands of Manx Shearwaters which we saw east of Venice, presumably of this race, differed from *P. p. mauretanicus* in their completely white under-parts, and most showed a distinct contrast between the dark crown and the white cheeks and throat. Three distinct types could be distinguished in the field. Those in the Adriatic had blackish-brown upper-parts and were scarcely distinguishable from *P. p. puffinus*. Most of those in the Aegean, and some in the Sea of Marmara, had chocolate-brown upper-parts, while the majority in the Sea of Marmara and the Bosphorus (and a few off Izmir) were much paler, with upper-parts sandy- or pale greyish-brown (appearing silvery in some lights). In some of the latter birds there was no clear line of demarcation on the head. In all plumages the scuttling flight provided an immediate distinction from *P. diomedea*.

CORY'S SHEARWATER (*Procellaria diomedea*).—On none of the hundreds we saw was there any visible trace of white above the tail, and the yellow bill was noticeable only at close range. In bright sunlight the upper-parts usually appeared dark brown, not grey-brown. The flight was quite different from that of other European shearwaters: two or three slow, heavy wing-beats followed by a *glide with wing-tips held below body and angled well back*—somewhat reminiscent of a Gannet (*Sula bassana*).

LEVANT SPARROWHAWK (*Accipiter badius*).—Seen in hundreds in the Istanbul area. We could detect no difference in flight or silhouette from *A. nisus*, but at close range the markings on the under-parts (*Field-Guide*) were distinctive enough. At a little



greater range, at least some adults showed a rather pale blue-grey mantle and upper wing-coverts, in contrast with blackish primaries, providing a good distinction from *A. nisus*; immatures appeared *strikingly white on the under-parts and underwings, contrasting with black primary tips*, the spots on the under-parts showing only at close range.

**SAKER FALCON** (*Falco cherrug*).—About thirty seen in Turkey. These appeared more angular than Peregrines (*F. peregrinus*), having a *longer carpal length and a longer, less tapering tail*. The flight was more “loose-limbed” than a Peregrine’s, but less powerful and direct than that of a Gyr Falcon (*F. rusticolus*). We never saw white on the head, and the only plumage character we found useful was the contrast between the *heavily spotted underwing-coverts* and the pale flight-feathers. The two Lanner Falcons (*F. biarmicus*) which we saw (in Greece) were more slender and rakish than any of the Sakers.

**LESSER KESTREL** (*Falco naumanni*).—The *much more active flight*, with extremely fast wing-beats when hovering, and the *very thin, tapering tail*, quickly distinguished both sexes from the Kestrel (*F. tinnunculus*).

**MEDITERRANEAN BLACK-HEADED GULL** (*Larus melanocephalus*).—Seen in thousands in Turkey (Nisbet & Smout, 1956).

*Adults*: The absence of black on the wings is usually regarded as an important field-character. Some five to ten per cent of the birds we saw had a little black on the wing-tips, usually consisting of a black outer web to the second or third primary and small terminal or subterminal spots on up to four other primaries. This appeared to disappear with wear, one bird having black on one wing and not on the other: it may be added that the wings of the adults appeared very worn, being noticeably shorter and less pointed than those of the immatures.

*Immatures*: closely resembled young Common Gulls (*L. canus*), but showed a more contrasting wing-pattern, the *whitish inner primaries and secondaries* contrasting with the blackish outer primaries and a *blackish subterminal line on the secondaries*. At close range the *heavy decurved bill* is a good character at all ages.

*Voice and habits*: A very silent bird in autumn, only occasionally uttering a deep-toned “kyow”, similar to a Herring Gull (*L. argentatus*), or an excited scream “kee-er” like a Black-headed Gull (*L. ridibundus*). We found it almost exclusively marine, rarely even crossing land, and the majority were seen in the immediate vicinity of towns.

**WHISKERED TERN** (*Chlidonias hybrida*).—The two which we saw appeared very different from Black Terns (*Ch. niger*) and White-winged Black Terns (*Ch. leucopterus*), being paler on the upper-parts, without a noticeably paler tail, and having much less black on the nape. Indeed this autumn plumage was scarcely distinguish-

able from that of a Common Tern (*Sterna hirundo*). One seen with a Black Tern was slightly larger, and heavier in flight.

**SOMBRE TIT** (*Parus lugubris*).—About 15 seen at Delphi. The best field-characters are the dark crown extending below the eye and the extensive dark bib, combined with its large size and general drab colouring.

*Voice*: Never “sirrah” (*Field-Guide*). The most characteristic note was a deep, chattering “chrrrrt”, quite unlike any other tit; also a variety of other strident calls recalling Great Tit (*P. major*).

**ROCK NUTHATCH** (*Sitta neumayer*).—An extremely noisy bird, with a wide range of very loud calls and songs. The most usual song is a golden cascade of shrill musical notes, with phrases such as “seea-seea-seea-seea-weeuw-wecuw-weeuw-weeuw” or “peeta-weeta-weeta-weeta-weet-weet-weet-weet-weet”, both in descending sequence. Other calls varied from rich fluty cadences to screams like a Jay (*Garrulus glandarius*), suggesting that its vocal ingenuity was quite inexhaustible.

**BLACK-EARED WHEATEAR** (*Oenanthe hispanica*).—Although we saw very many in Greece and Turkey we could discover no reliable plumage distinction between females and immatures and those of the Common Wheatear (*Oe. oenanthe*). The best character was the *call-note*, a rasping “tshrrrek” quite different from the Common Wheatear’s “tac . . . tac”.

**THRUSH NIGHTINGALE** (*Luscinia luscinia*).—The three which we saw were less skulking than Nightingales (*L. megarhynchos*), stockier in shape, with more olive-grey upper-parts and dark rufous tail reddest at the base. When flushed, this species can be distinguished from a Bluethroat (*Cyanosylvia svecica*) by its paler brown upper-parts and browner tail, with duller and less conspicuous red flashes.

**OLIVACEOUS WARBLER** (*Hippolais pallida*).—The buffer immature birds may be confused with Garden Warblers (*Sylvia borin*), but can readily be distinguished by the combination of the paler grey upper-parts, whitish orbital ring, *Hippolais* shape and stance, *long broad bill* and “trrk” *call-note*. A young Barred Warbler (*S. nisoria*) is also superficially similar, but is larger, with a heavier bill and a longer tail, apart from other differences. In south-east Europe it is also necessary to distinguish it from the Olive-tree Warbler (*H. olivetorum*): the one Olive-tree Warbler we saw appeared noticeably *larger and heavier*, with a more pear-shaped body and a *long deep bill*; it also appeared browner on the upper-parts, with a distinct light eye-stripe, and its call-note was a disyllabic “tr-trik”.\*

\*Upcher’s Warbler (*H. languida*), which breeds north to Syria, is also similar, but it is doubtful if it could be distinguished in the field, except by its note which Mr. W. B. Alexander tells us is distinctive.

SUBALPINE WARBLER (*Sylvia cantillans*).—All the birds we saw had buff or pinkish-buff under-parts, affording a quick distinction from the Sardinian Warbler (*S. melanocephala*), some of which were otherwise similar. (The Subalpine is further differentiated by its small size, neckless appearance and thin pointed bill.) The call-note "strk-strk-strk" was more churring and less staccato than the Sardinian's.

CHIFFCHAFF (*Phylloscopus collybita ?abietinus*).—All the migrants in the Istanbul area in late September had dark brown upper-parts and buffish under-parts (with little or no green or yellow) and gave a distinctive call-note, a very loud, shrill "whceecce", suggesting a Yellow-browed Warbler (*Ph. inornatus*) but dropping slightly at the end.

COLLARED FLYCATCHER (*Muscicapa albicollis*).—Although all the migrants showed a large area of white on the wing they could hardly be distinguished from Pied Flycatchers (*M. hypoleuca*) on this character alone. However, of 40 or 50 birds closely examined about one-third showed white or whitish on the rump, and all showed a *distinct light moustachial stripe* extending below the ear-coverts to form a half-collar. They were most easily identified by the distinctive *voice*, a loud "hwee" (recalling the Chiffchaffs' described above), with great carrying-power and usually uttered from thick cover.

RED-BREASTED FLYCATCHER (*Muscicapa parva*).—In addition to the usual rattling note we often heard an abrupt "chick". The local Spotted Flycatchers (*M. striata*) had a very similar note.

TAWNY PIPIT (*Anthus campestris*).—The call-note of most birds in Greece and Turkey was a sparrow-like "chirrup". We have heard this call from migrants in Denmark and Sweden and we regard it as the normal autumn call of the species. The one Richard's Pipit (*A. richardi*) which we saw had a call which was not very different: the *Field-Guide* implies that such a harsh call is diagnostic of Richard's.

CRETZSCHMAR'S BUNTING (*Emberiza caesia*).—Call-note of birds in Greece an insistent "styip", quite distinct from the soft "tlip" of the Ortolan Bunting (*E. hortulana*).

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## NOTES

**Vagrants at Skokholm in September 1956.**—At Skokholm the period 9th-12th September 1956 was one of outstanding interest, with considerable variety of common migrants and four species which are major rarities in Wales. Two juvenile Ortolan Buntings (*Emberiza hortulana*) were seen on the 9th, four on the 11th, and three on the 12th. A Bluethroat (*Cyanosylvia svecica*), a juvenile Melodious Warbler (*Hippolais polyglotta*) and a juvenile Barred Warbler (*Sylvia nisoria*) were all present on the 12th. Two of the Ortolans and the Barred Warbler were caught in mist-nets, and the Melodious Warbler in the Heligoland trap. The Bluethroat remained until the 15th, but was not trapped. The Barred Warbler was the second recorded in Wales, and the Bluethroat only the third.

Of the birds caught, the Ortolans weighed 24.8 and 25.7 gm., with wing-measurements of 87.5 mm. in both cases; the Melodious weighed 9.6 gm., wing 64.5 mm; and the Barred Warbler weighed 29.6 gm., wing 88 mm.

The meteorological situation was clear-cut, indicating a down-wind drift from western France, with almost complete cloud-cover throughout the period contributing to loss of orientation. A warm front brought fresh to strong south-east winds to the Channel and the south-west on the 8th. These decreased on the 9th, and an Azorean high extended a ridge across Biscay and the western approaches. Winds were variable and gentle between Wales and France on the 10th, south-east on the French coast. This situation persisted until the 12th except in Wales, where decreasing westerly winds were prevalent from early on the 11th.

Many species were associated with the movements at this time, with warblers (especially Whitethroats, *S. communis*) abundant on the 9th and 10th, and exceptional numbers of wagtails (*Motacilla* spp.) from the 9th to the 11th. Corncrake (*Crex crex*), Spotted Redshank (*Tringa erythropus*), Ruff (*Philomachus pugnax*) and Turtle Doves (*Streptopelia turtur*) on the 10th, and Nightjar (*Caprimulgus europaeus*) on the 12th, are all species with strong "drift associations" on the west coast in autumn.

Neither the Bluethroat, with its distinctive tail-pattern, nor the very large and grey Barred Warbler, present any great problems in field-identification; but since the Melodious Warbler and the Ortolan have both received attention in the pages of this journal recently (*antea*, vol. xlix, pp. 119-120, 232-233; and pp. 330-331 respectively), a few words may be written about them. Before trapping, the Melodious had been identified as such simply on the basis of the generally yellow colouring, the head-shape and *small size* (I am more familiar with the larger Icterine, *H. icterina*). Later, through glasses at ten yards in excellent light, the absence of any pale patch on the wing was noted. The plumage was very

worn, and no pale edgings remained on the secondaries. In the hand, the wing-formula and measurements excluded the possibility of Icterine Warbler, and the combination of brownish-olive upper-parts and yellow under-parts ruled out Olivaceous (*H. pallida*).

#### THE FIELD-IDENTIFICATION OF THE ORTOLAN BUNTING

In the case of the Ortolan, one must echo I. C. T. Nisbet's statement that the distinctive "tlip" call-note is the most useful character. Once this is learned there can be little reason to label the species "difficult", for the call is frequently used. In the past five years I have watched some twenty Ortolans in Britain, mainly juveniles, but until the autumn of 1956 had heard no other call apart from the disyllabic variation "tillip". At least one of the 1956 Skokholm birds gave a high, whistling "tew", however, like a rather clipped version of the characteristic whistle of the Lapland Bunting (*Calcarius lapponicus*). This note was used in flight, and as the bird was about to land. Perhaps I have been fortunate in my Ortolans, for I have never seen one in which the orbital ring was not conspicuous at reasonably close range; often in juveniles it is dirty white with little suggestion of yellow, and is much more sharply defined than is usual in young Yellowhammers (*E. citrinella*). The moustachial streak has usually been better defined and paler in colour (between almost white and pale primrose) than in any young Yellowhammer of my acquaintance. Perhaps the degree of definition and of yellowness is related to the advance of the autumn moult into first-winter plumage in September-October, when all my birds were seen. Things may be more difficult earlier in the season. One of the juveniles trapped on 12th September was much brighter about the head than the other, and was showing a few of the grey-green feathers of the first-winter bird. One other point of difference from the Yellowhammer is that the Ortolan has white on the outer webs of the outer tail-feathers, whilst the Yellowhammer does not. This can be seen in a back view, and may be of use if one is not happy about the colour of the rump, which can look almost chestnut in the Ortolan.

PETER DAVIS

**Little Buntings in Surrey.**—On 31st March 1956, during a period of strong north-easterly winds, two Little Buntings (*Emberiza pusilla*) were identified after a considerable influx of small Passerines at Beddington Sewage Farm, Hackbridge, Surrey. The presence of a third bird was suspected, and this was confirmed on 3rd April, when one of the birds was seen to be bearing a fairly bright metal ring, the other two birds being unringed.

Throughout the duration of their stay (the last bird was last seen on 21st April) the birds frequented a ploughed field which had been banked out into a series of small shallow "pans" before being flooded with sewage-sludge. Here they fed in the shelter of the "pans" with up to ca. 300 Meadow Pipits (*Anthus pratensis*)

and ca. 50 Tree Sparrows (*Passer montanus*).

In the field the birds presented striking differences in plumage and the colour of the head-markings, but all three birds when compared with the pipits and sparrows were shorter, and they had the typical bunting shape and bill. Two of the birds were in "bright" plumage, whilst the third was very dull in coloration. At distances of up to forty yards the bright birds appeared warm brown on the upper-parts, with two widely spaced creamy-white stripes running down the back, whilst the under-parts were whitish, streaked black. In the duller bird the warm brown on the upper-parts was lacking, and although the two parallel stripes down the back were still present, they were greyer and less well defined.

Although it is not mentioned in the majority of the literature, our observations suggest that these two stripes, combined with the small size of the bird, are the easiest means of identification in the field, as both these features are readily visible when no others can be made out. It was apparent that the chestnut cheek-patch (referred to in the literature as being the main identification feature) was not, in this case, a reliable means of identification of all three birds.

When feeding, the birds crept along very close to the ground and presented a rather "hunch-back" appearance. Periodically they perched on clods of earth, or other raised objects, where they flicked and fanned their tails, showing the white on the outer feathers, in a manner similar to that of the Reed Bunting (*E. schoeniclus*). The call-note, which was only heard on the two or three occasions when the birds were flushed underfoot, was a quiet, short, "pic pic".

In view of the marked differences in plumage of the three birds, a critical examination of about 150 skins of this species, together with some of other buntings (*Emberiza* spp.), was made at the British Museum (Natural History), London. This examination showed that the species is subject to extreme variations in plumage, and also confirmed that all three birds were Little Buntings. The exceptional amount of variation is thought to be probably due to the complicated series of complete and partial moults through which the birds pass.

#### DESCRIPTION

(1) Bright unringed bird—present until 21st April. (*Upper-parts*) Crown chestnut, bordered by thin brownish-black line. Superciliary stripe cream. Cheek-patches chestnut, bordered with brownish-black line. Chin white with thin black moustachial stripe. Mantle warm brown streaked black, with two widely spaced broad creamy-white stripes running parallel down the back. Rump paler than rest of upper-parts. Primaries brownish-black. Coverts brown with some chestnut. Tail brownish-black with outer tail-feathers conspicuously edged white. (*Under-parts*) Throat and belly white with black streakings on breast and flanks.

(2) Bright ringed bird—present until 14th April. General appearance similar to, but rather brighter than preceding bird, with the following marked



differences:

- (a) Thick black bordering to the chestnut crown.
- (b) Cheek-patch almost entirely dark brown with a faint suggestion of chestnut when seen in bright sunlight.
- (c) Striking chestnut wing-coverts.

Towards the end of their stay both the above birds showed a well marked increase in the amount, and intensity of colour, of the chestnut markings, though when last seen, the ringed bird still only showed a slight trace of chestnut on the cheek-patch.

(3) Dull bird—present until 18th April. (*Upper-parts*) Head greyish-brown with less distinct markings than the other two birds had; these markings were, however, fairly evident when viewed through a telescope ( $\times 40$ ), but through binoculars ( $\times 8$ ) it was hard to be certain of the colour-pattern at normal distances (see drawing by P. J. Hayman on plate 36 lower). Back pale grey-brown with the two parallel stripes a pale greyish-white. Wings greyish-brown with no chestnut on the coverts. Tail brown with outer tail-feathers edged dull white. (*Under-parts*) Dull white with faint brown markings.

This note has been compiled from the field-notes of B. P. Austin, B. S. Milne, C. M. Perrins, R. E. Scott and the writer.

G. J. HARRIS

[As a result of the promptness on the part of Mr. Harris and his friends in informing others of the presence of these birds, they were seen by a large number of observers including ourselves.—P.A.D.H., I.J.F.-L.]

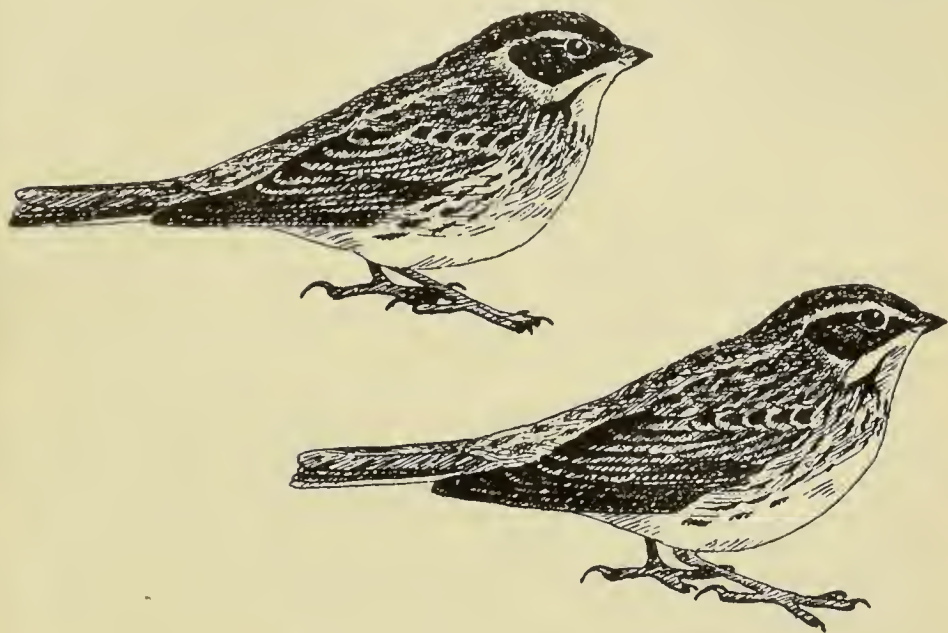
**Little Buntings in Middlesex.**—At 1020 hours G.M.T. on 7th April 1956, on the causeway of the Staines Reservoir, Middlesex, I flushed two small buntings quite unlike any that I had ever seen. I spent the next hour in close contact with them, at times as near as 10 yards.

Both birds were obviously small, rather short-tailed buntings, comparable in size rather to a Linnet (*Carduelis cannabina*) than to a Reed Bunting (*Emberiza schoeniclus*), both of which species were present in the same area. They were distinctly smaller than a Meadow Pipit (*Anthus pratensis*) which fed beside them at one point. Their appearance in flight was compact, reminiscent of a small finch, with none of the tail action of the larger buntings. Their movement on the ground made me choose the simile of "a small dainty sparrow", with the rather neckless look of that bird. The buntings both walked and hopped as they fed briskly on the grass.

In plumage, the most noticeable feature of the birds was the head. In both, this was strikingly chestnut on the crown and ear-coverts. In one (A in sketch) there were also lines of heavy black flecking along the lower sides of the crown and round the ear-coverts; it also had a less distinct eye-stripe than the other (B). Otherwise, birds were almost alike. There was a short back moustachial stripe from below the bill, which joined a fairly narrow breast-band of flecks (see sketch). This flecking was continued down the flanks, but the under tail-coverts, belly, throat and chin were all clear off-white. The upper-parts were closely alike, the main colour being a dun-brown, with streaks on

the nape, the mantle and the rump, which in the bird with the lighter-coloured head showed quite light in flight. The white outer tail-feathers were often obscured on the ground, but were fairly obvious against the dark inner tail-feathers in flight. The legs and feet were of a light red-brown colour. The bills of both birds were dark; at close range a horn-coloured base to each mandible showed. I could not say with certainty whether the birds called when flying in alarm with the other Passerines in the area, though several single quiet notes ("twick") may have come from them.

1957



*dim wallace*

LITTLE BUNTINGS (*Emberiza pusilla*): STAINES RESERVOIR,  
MIDDLESEX, 7TH APRIL 1956

(Drawn by D. I. M. Wallace)

The upper bird is referred to in the text as "A", the lower as "B".

From these observations I was able to identify the birds as Little Buntings (*E. pusilla*), possibly a pair. D. I. M. WALLACE

[It is interesting to note that these two Little Buntings were present at the Staines Reservoir on a day during the period in which three were being watched at Beddington in Surrey (see pp. 206-208).—EDS.]

**Atlantic crossing by Starling.**—Recent investigators have offered convincing evidence that many species of land-birds, given certain weather conditions, are able to cross the Atlantic unaided. That some assisted passages do occur, however, is suggested by the following example.

My wife and I sailed from Halifax, Nova Scotia on the R.M.S. "Aseania" at midnight on the 31st March 1956. Early the following morning we saw a Starling (*Sturnus vulgaris*) perched on the rail of the boat-deck. This bird remained with us throughout the voyage and we last saw it on the afternoon of the 8th April, just before our arrival at le Havre.

The bird was normally active and appeared to be in good condition throughout its stay on the ship. It took frequent "exercise" flights and would at times drop far astern, out of sight, only to appear a few minutes later, easily overtaking the ship. This performance was even carried out in the face of headwinds of almost 20 miles per hour. Although bread crumbs were supplied by passengers, the scraps left on the deck after waste from the galley was dumped overboard would have provided an ample supply of food.

G. F. BOYER

## REVIEW

THE BIRDS OF THE LONDON AREA SINCE 1900. By a Committee of the London Natural History Society (Chairman: R. C. Homes). (*Collins*, London, 1957). 305 pages, 40 photographs, 5 maps. 30s.

OF THE MANY and varied ways in which man has stamped his history and methods of life upon the surface of the world the production of the great urban area of London is unique. Not only has this built-up area had perhaps many more bird-watchers than any other part of Britain, but there has been created for birds a wide range and variety of habitats that are reflected in the richness of the city's avifauna. For many years the London Natural History Society has kept watch over the area which lies within a radius of 20 miles from St. Paul's Cathedral and which reaches to Ware in the north, Redhill in the south, Slough in the west and Tilbury in the east. Each year an annual report has been produced by the Society and, as the material accumulated and changes became apparent, it was decided to plan a book based on this wealth of information.

This book is the happy result of the researches and deliberations of a committee of the London Natural History Society under the chairmanship of Mr. Richard Homes. The period from 1900 was chosen because the Society's own records go back to about that time, there were county avifaunas for Kent and Surrey published in the first decade of the century and summaries on birds were issued about the same time in Victoria County Histories. This remarkable book is a great step forward in the treatment and presentation of the birds of a region. No longer are the birds unimaginatively listed with just the bare facts of their distribution and history. Though much of the book is devoted to a systematic



list, compiled with an exactitude and completeness of the highest order that will keep it for many years as a source-book for students, it is, however, the section devoted to an examination of the chief habitats, of migration and of roosts and fly-lines which places the work in a special category. This section is made up of 12 chapters written by a number of contributors; this could easily have produced both an uncertainty and raggedness of method, but it is clear that the many inevitable meetings and discussions of the committee have resulted in co-ordinated and fluent expositions of a variety of topics. This co-operative effort by a number of first-rate amateurs shows clearly the vital part played today by the amateur in working at matters of solid investigation and in bringing the results clearly before the general reader.

The subjects covered in the first section of the book include the physical background to the London area and the examination of certain habitats within the boundaries of the Society's area. It is gratifying to read in the chapter on the reservoirs that "we can still regard without misgivings the position of the aquatic species occurring around London". The story of the gains and losses and reports of no change in the status of birds makes most interesting reading. On the profit side the reader will find, as in the case of the reservoirs, that the bird-life of London "has been greatly enriched" by the existence of gravel-pits and waste land. The chief losses have taken place among the Thames marshes and on the commons, downs and parkland; the importance of the Green Belt is stressed for the birds of the latter group. Among the various woodlands that surround the Metropolis the changes since 1900 "do not seem to have been as great as might have been expected", and the bird-life of the arable land does not appear to differ materially from that of other arable districts. It is remarkable to note in passing that  $\frac{7}{8}$  of the belt of land lying between 15 and 20 miles from St. Paul's is given over to agriculture.

There are many examples of the research upon which the Society has been engaged: the mapping from the air and the ground of all open gravel-pits after the breeding in 1944 of a pair of Little Ringed Plovers (*Charadrius dubius*) at a pit in south-west Middlesex; the detailed surveys of Beddington Sewage Farm and Bookham Common; the censuses carried out on agricultural land and the co-ordinated watches for broad-front visible migration over the built-up areas. The study of roosts and fly-lines, particularly in relation to the Starling (*Sturnus vulgaris*), resulted in 1949 in the Ornithological Section beginning a 3-year census and involved "the ringing of over 5,000 starlings in Trafalgar Square at night and in suburban gardens by day": it soon became clear that there was no foundation for the old belief that the Central London roosts reached their maximum numbers in October. Further, the great majority of Starlings roosting in

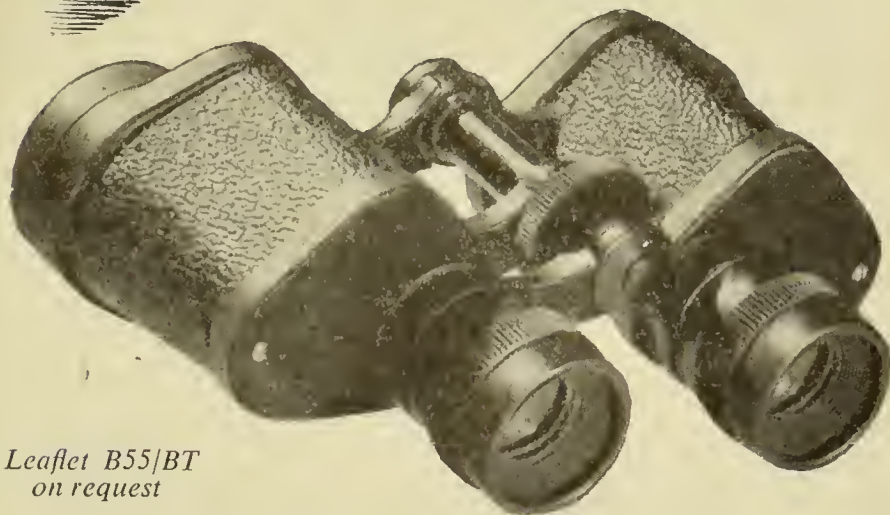
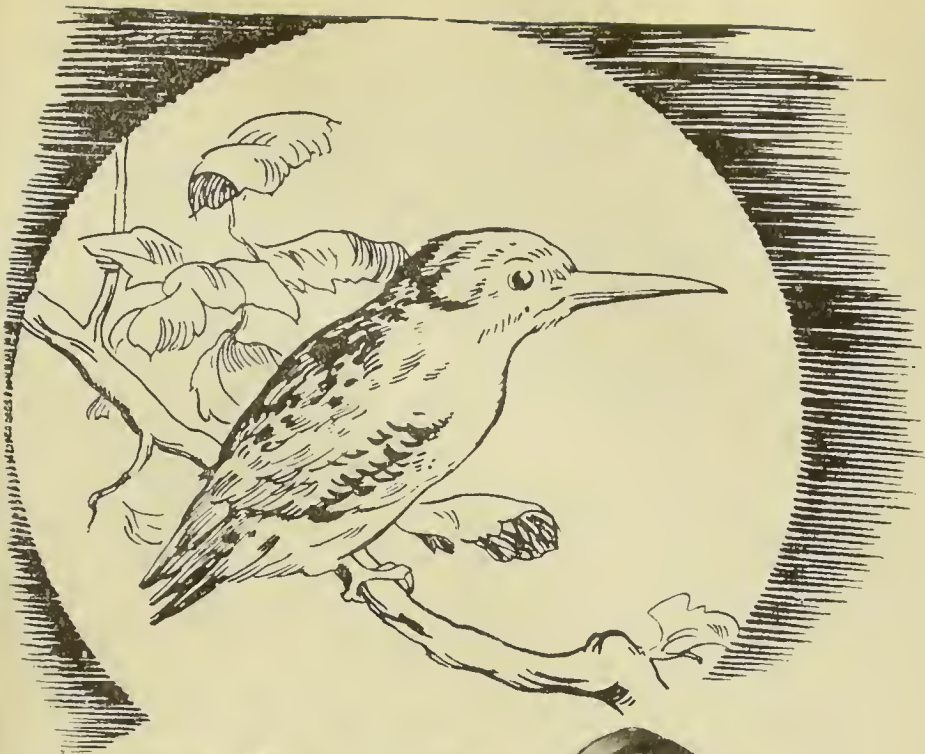
London are British residents, for of the 297 recoveries of the 3,275 birds ringed in Trafalgar Square only 14 came from outside the London area—11 from elsewhere in Britain and only 3 from the Continent.

In each discussion there is an analysis of the changes that can be traced in the last half-century and here there is both a skilful presentation of the facts and of the reasoned conclusions that may be drawn from them. The section on Inner London is particularly rich in detail for there can be but few ornithological habitats which have been so closely watched and for which so complete a history exists. The same cannot, however, be said for the chapter on "The Suburbs", for it is obvious that there is little information for many parts of suburban London, especially for those which were built around 1930 and differ in many ways from other conceptions of suburbs. Much of Outer London is made up of housing estates with semi-detached or terraced houses where blocks of gardens of small or medium size are frequently separated by streets lined with municipally mangled trees, by small recreation grounds, by factory areas and by occasional allotments. Here the Song Thrush (*Turdus philomelos*) is barely holding its own whereas the Blackbird (*T. merula*) has increased enormously, adding to the number and variety of its nesting-sites each year; in a square mile of such an area of suburbia where some 190 pairs of Blackbirds nest annually the Song Thrush has been reduced to 6 pairs and the Mistle Thrush (*T. viscivorus*) to one. In the winter months the Common Gull (*Larus canus*) in North-West London has in the last five years ousted the Black-headed (*L. ridibundus*) as the chief scavenger. The reviewer's experience of the bird-life of some of these suburban districts is in many ways different from that revealed in this book. It would be of great value, despite the comparative difficulty of surveying an area of so many small private plots, if a study of this typical part of suburbia could be undertaken, since, after all, a high proportion of Londoners also live in this particular habitat.

The systematic list is both succinct and readable. In relation to such interesting London species as the Great Crested Grebe (*Podiceps cristatus*), the Heron (*Ardea cinerea*), the Little Ringed Plover and the Black Redstart (*Phoenicurus ochruros*) very detailed accounts of their histories are given: 245 full species are included in the list, of which 110 are known to have bred during this century and about 100 probably still do so. Of the 40 excellent and well-chosen photographs more than half are of typical habitats, and it is a welcome change to find so high a proportion devoted to environments without which any discussion of the status of the birds of an area would be pointless. There are also an appendix for introduced and escaped birds, a working bibliography and an index. The whole book is attractively produced and represents an achievement of which the London Natural History Society may justifiably be proud. E.S.

8 MAY 1957

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# BRITISH BIRDS



JUNE 1957

THREE SHILLINGS

***50th Anniversary Number***



# BRITISH BIRDS

AN ILLUSTRATED MONTHLY MAGAZINE

Edited by

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CONTENTS OF VOLUME L, NUMBER 6, JUNE 1957

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## 50th Anniversary Number

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	PAGE
Plate I: Collared Doves. Specially painted by R. A. Richardson	<i>Frontispiece</i>
Editorial: The First Fifty Years ... ..	213
50th Anniversary Messages (from Belgium, Canada, Czechoslovakia, Denmark, France, Germany, Great Britain, Holland, Hungary, Iceland, India, Ireland, Japan, New Zealand, Norway, Sarawak, Sweden, Switzerland, United States, U.S.S.R. and Yugoslavia) ...	224
Collared Doves in Norfolk: a bird new to the British Isles. By R. A. Richardson, M. J. Seago and A. C. Church. Photographed by P. R. Clarke and R. P. Bagnall-Oakeley (plates 41 right, 42) ...	239
A desert race of the Great Grey Shrike, new to the British Isles. By Kenneth Williamson. Photographed by H. A. Craw (plate 41 left) ...	246
Photographic studies of some less familiar birds. LXXXII—Great Grey Shrike. Photographed by Eric Hosking and F. Götschi (plates 37-40). Text by I. J. Ferguson-Lees ... ..	250
Sewage-farms as bird-habitats. By A. W. Boyd (with a section on Nottingham sewage-farm by Dr. R. J. Raines) ... ..	253
Nest-hole excavation by the Bee-eater. By Guy Mountfort. Photographed by Eric Hosking (plates 43-45) ... ..	263
The Dipper's winking. By James Alder (plates 46-47) ... ..	267
Notes:—	
The Penguin-dance of the Great Crested Grebe (K. E. L. Simmons) (photographed by J. H. Drenth—plate 48) ... ..	269
Collared Dove in Surrey (G. H. Forster) ... ..	270
Return of Great Grey Shrike to winter territory (A. W. Boyd) ...	271

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Cover photograph by Stuart Smith: Lesser Spotted Woodpecker (*Dendrocopos minor*) with food at nest







COLLARED DOVE (*Streptopelia decaocto*), ADULT AND YOUNG  
(Norfolk, 1955-1957, see page 239)

*Specially painted for "British Birds" by R. A. Richardson*

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1957



3 JUN 1957  
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## BRITISH BIRDS



### EDITORIAL

#### The First Fifty Years

EARLY IN 1907 H. F. Witherby approached many friends and fellow-ornithologists to support a monthly magazine devoted entirely to the study of British birds, which had long been in his mind. A note in his handwriting records how, at the British Ornithologists' Club that January, the Hon. Walter Rothschild agreed "that there was imperative need for such a magazine" and offered financial support. Further MS. notes show that before the title under which every issue has appeared was found, others were considered and discarded, such as "The Magazine of British Ornithology", or "The British Ornithologists' Magazine".

The earliest note of the objects is: "To be devoted to the study of birds on the British list and mainly to the study of them in the British Islands, but notes and articles on observations abroad of birds rare in Britain would be allowable". Great stress was placed on the co-operation of good observers all over the country as "local advisers", and one of the first steps was to circularize a picked group who were asked to help "in cases where a confirmation of a record or observation was considered advisable" and to ensure good reliable notes from a wide field, and also to help from time to time with systematic investigations.

In writing on 17th February to A. H. Evans, Witherby explained that the chief points were:—

"(1) To form as complete a record as possible of what has been done during the month by means of original contributions and by abstracts, and references to what has been published elsewhere, whether in other journals or in proceedings of Nat. Hist. Socs. (in short to keep Yarrell up to date month by month).

"(2) By this means and by means of a number of local advisers well spread over the country to make enquiries into many questions which cannot be solved except by wide contemporaneous investigations under some sort of control.

"These two are my main ideas, but there are other points in the scheme which should appeal to all interested in British birds



. . . so much is known of British birds that the day seems to be passing for isolated notes here and there which can never clear up the many problems (systematic and biological) which can only be solved by systematic investigation”.

Looking back with the advantage of half-a-century's harvest of experience it is astonishing how firm a grasp of essentials Witherby showed in these concise preliminary thoughts. The mention of Yarrell alone reminds us that he was writing in the infancy of modern ornithology, yet he had already understood the need for blending systematic and biological studies with the most extensive amateur co-operation, no longer haphazard but focused on selected problems and backed by central organization, and by discriminating methods of raising standards of skill and accuracy. Here, perhaps for the first time, appears the germ of the great recent growth of scientific field-ornithology. Yet Witherby equally recognized the need for replacing the intermittent and uneven individual standard works by a co-operatively conducted and currently consolidated authoritative record. The first paper in the first issue was an outline from Howard Saunders of “Additions to the List of British Birds since 1899”, bringing up to date the Second Edition of his famous *Illustrated Manual of British Birds*, and this was immediately followed by the comprehensive series of papers by H. F. Witherby and N. F. Ticehurst “On the More Important Additions to our Knowledge of British Birds since 1899”.

While this first of the two “chief points” foreshadowed *The Handlist*, *The Practical Handbook* and eventually *The Handbook*, gradually building up an authoritative and comprehensive account of the systematics, plumages, identification and movements of British birds, the second point led through a number of separately-organized investigations of distribution and habits to the eventual birth of the British Trust for Ornithology, whose Regional Representatives broadly fulfil, with the Editors of Local Reports, the rôle which Witherby envisaged for the “local advisers”.

But this was far from being the full extent of Witherby's prevision. He noted with similar directness:

“Photography—Aim at getting people to take photographs not merely for the sake of a portrait but for the sake of demonstrating some point, i.e. scientific photography of birds”.

In the first Editorial this was amplified by pointing out, for example, that “a photograph of the environment of a nest is . . . often of more value than one of the nest itself, and similarly, photographs of birds in attitudes such as flying, feeding, courting, hiding, nest-building or otherwise engaged, are of more value than pictures of birds in repose”. The fact that the apparatus for doing some of these things satisfactorily was not yet invented at that time was quite rightly brushed aside as a difficulty to be overcome by resolution.

Under "Reviews of books" appear the salutary words: "Always state without fear or favour whether the book can be recommended and for what purpose".

An "Information column" was contemplated "where questions could be answered and advice given to beginners".

If the editorial conceptions were strikingly in tune with the outlook of half-a-century later, the first calculations of cost soon remind us that we are back in a vanished world. It may now be revealed that the original estimates contemplated a monthly sale of 200 or 300 copies at 6d. or 9d. each with 32 pages and 1 plate to be produced at a cost of £14 for printing and paper, involving a monthly deficit of £6-£11. It was boldly suggested that after a time the circulation should go to 400 or 500. However, after fuller consideration the price was fixed at One Shilling and Witherby stated: ". . . it is my intention to devote any profit made by the Magazine to extending its usefulness by the addition of pages, or plates, or by whatever means are considered most expedient".

On 1st June 1907 the first issue appeared, edited by H. F. Witherby, assisted by W. P. Pycraft. The Editorial began by thanking those "who have so generously promised their support both in contributions to our pages and to our funds" and stated that already over a hundred ornithologists in various parts of the country had promised to help in organized inquiries "into such questions as the extension or diminution of the breeding range of certain species, the exact status and distribution of some birds, the effects of protection in certain areas and on different species, the nature of the food of particular birds, and many kindred subjects". It went on: "Could observations on such points be conducted on a common basis and made contemporaneously in different parts of the country, results of great interest and of very considerable scientific importance would be achieved".

Howard Saunders, in his opening paper, described some 20 species added to the British List during the past eight years, and the following paper on the "Home Life of the Osprey" was by P. H. Bahr (now Sir Philip Manson-Bahr). Other contributors were Dr. P. L. Sclater and F. C. Selous, while a note contributed by W. Eagle Clarke gave the first records of Arctic Terns (*Sterna macrura*) wintering in the Antarctic, and ranging from 82°N. to 74°S.

Within a week of publication, Professor Alfred Newton's death at Cambridge broke perhaps the greatest link with Victorian ornithology, and in the July issue Bowdler Sharpe, in an Obituary, discussed Newton's part in founding the British Ornithologists' Union and recorded how plans for publishing *The Ibis* were first discussed in 1857, just a century ago. In the same issue the Hon. Walter Rothschild first brought to the notice of field-ornithologists in Britain the differences between the Willow Tit

(*Parus atricapillus*) and the Marsh Tit (*P. palustris*). This July issue was also remarkable for a note by Victor Wilson who wrote "If ornithologists all around England would but trap birds and mark them, by a metal ring or otherwise, and advertise their having done so in this Magazine, how much we should be able to learn of their movements which we do not at present know". To this the Editors added: "The plan of marking birds by an aluminium ring round the leg has often been tried, but never in a really systematic fashion. It would certainly teach us a great deal that cannot conceivably be learnt in any other way. To place rings on the legs of young birds just before they fledge would not be a great difficulty. We should like other readers' opinions on this matter". Thus was conceived the national scheme of bird-marking which has ringed over one and a half million birds.

A letter from a Dutch ornithologist in that July issue showed that *British Birds* was already being read in the Netherlands on the first day that its first issue appeared—a pleasing incident echoed in the messages of goodwill from our Dutch friends which we have the privilege of printing in this number (pages 230-231).

In the October issue appears for the first time a subject which was to trouble ornithologists from that day to this, Dr. N. F. Ticehurst's paper "On the Yellow Wagtails and their Position in the British Avifauna".

The principle of reviewing without fear or favour was upheld with zeal; for example, in the notice of T. H. Nelson's *Birds of Yorkshire* where praise was blended with outspoken criticism, ending with the reproach that the illustrations were printed upon heavily "loaded" paper "which, as is well known, crumbles away in a few years, and had the illustrations been of more scientific value this would have been a drawback". It is fair to add that in 1957 the illustrations in the editorial copy still show no signs of disintegrating, despite this stricture.

In October, *British Birds* lost its first contributor, Howard Saunders, with whom an era ended. This was marked by the appearance, in the same issue as his Obituary, of a paper by Ernst Hartert describing under trinomials no less than twenty-one species represented here by forms peculiar to Britain, including unfortunately an ill-considered English Crossbill (*Loxia curvirostra anglica*), but demoting the Red Grouse to subspecific rank as *Lagopus lagopus scoticus*. Hartert expressed here strong views on the need for stability in nomenclature which he claimed "is of greater importance than grammatical exactness" and repudiated the doctrine of correcting supposed false concords, asking, "Can one say that . . . names like . . . *loreto-yacuensis*, *jala*, *fanny*, and so on, or the many awful names of P. L. S. Müller . . . are Latin? . . . we must not alter them, and have to adopt them, even if they shock our classical nerves, and they must remain as mementoes of the recklessness or stupidity of their creators".



In the same issue appeared a plea that "the whole subject of economic ornithology should be undertaken by a specially qualified staff, under the Board of Agriculture, as has long ago been done in America", but this was not to begin for another four decades here. In January 1908 the first *British Birds* investigation was launched, by C. B. Ticehurst, to trace the facts about Woodpigeon (*Columba palumbus*) Diphtheria. Another name which appeared in this first volume was that of F. C. R. Jourdain and it is strange to find a review over his initials complaining "In these days when we are overwhelmed with popular compilations of the tritest nature on British birds . . .". What would he have written 40-50 years on? In January two well-known observers described and illustrated the breeding of the Hen Harrier (*Circus cyaneus*) in Surrey: the discovery soon afterwards that these birds were really Montagu's (*C. pygargus*) was a never forgotten lesson in the pitfalls of editing.

In February appeared a note that "Miss L. J. Rintoul and Miss E. V. Baxter, two very keen and competent ornithologists . . . have spent a month . . . in birdwatching on an island" (the Isle of May), while Fair Isle is described as "becoming a second Heligoland under Mr. Eagle Clarke's able 'management'". Another aspect of ornithology which has unfortunately become neglected recently was opened by Dr. N. F. Ticehurst's interesting analysis of bird remains, including a Great Auk (*Alca impennis*) bone from a thousand-year old fortified dwelling in Orkney—the first of a rich series of studies in British ornithological history. Witherby and Ticehurst brought history up-to-date in April with a review of the spread, then beginning in earnest, of the Little Owl (*Athene noctua*).

In March appeared an appeal for the Watchers' Fund of the Royal Society for the Protection of Birds, which deplored the "damage caused to our rarer breeding birds . . . by, or on behalf of, those who are professedly lovers of our favourite science" and that consequently "Ornithologists must . . . provide and pay for 'watchers' to defeat these destructive ignoramuses". Despite this realism the somewhat rash and still unfulfilled prophecy was ventured that "there can be no doubt that we shall soon have the great satisfaction of regaining this handsome and interesting bird" (the Spoonbill, *Platalea leucorodia*) "as a regular breeding species". The last number in the first volume contained "Some Observations on the Song-periods of Birds" by C. J. and H. G. Alexander, and the last note in the volume records a Leach's Petrel (*Oceanodroma leucorhoa*) found in Aberdeenshire by A. Landsborough Thomson.

In May 1908, with the first volume ready for binding, the Editors declared support to have justified their conviction that a magazine entirely devoted to the study of British birds was required, and added "we are ambitious, not only that contributors shall grow in numbers, but that their contributions shall be of

even greater value, for the study of British birds is fraught with possibilities as yet unsuspected. We desire to supply a need, and to make that need so real, that it will gain in intensity as the years roll on".

Having been so well launched on its ambitious course, *British Birds* had, as it proved, another six years to consolidate itself before the outbreak of the First World War in 1914. In the second volume the great task of reviewing "Additions to our Knowledge of British Birds since 1899" was completed, and scholarly bibliographical accounts were given of a dozen "Early British Ornithologists and their Works" by W. H. Mullens in a series of nine papers. New ground was broken by C. B. Ticehurst and Miss A. Jackson on the "study of nestling birds, hitherto so strangely neglected", while C. J. and H. G. Alexander pioneered bird-census work in Britain with their paper "On a Plan for Mapping Migratory Birds in their Nesting Areas". In referring to "their novel method of mapping out the haunts of selected species" the Editors rightly said that it would "serve as an invaluable model for further work", most of which was, however, to follow only after an interval of nearly twenty years.

Another paper which consciously represented an attempt to penetrate a new field was F. B. Kirkman's "Variation in the Nests of the Arctic and Common Terns", following up W. P. Pyecraft's paper on evolution of nests, in the previous volume. "It should not be difficult", wrote Kirkman. "either by marking birds or watching their behaviour in captivity to find out whether they tend to continue the use of nesting material once adopted . . . . Facts it is that are wanted, and so far as nests are concerned it should not be difficult to collect a large number. Those who are prepared to co-operate in this work will at least have the satisfaction of feeling that their time is being put to good use. The question of variation, specific or individual, structural or functional, occupies to-day a place in the foremost rank of scientific problems because it takes us to the roots of the evolution theory. It has no mere academic importance. Human progress depends upon human control of natural forces. There can be no control of these forces except by understanding the laws that govern their operation. And these laws can be reached only through a persevering accumulation of seemingly trivial facts".

B. F. Cummings (W. N. P. Barbellion) contributed an early account with a map of Starling (*Sturnus vulgaris*) roosts and flylines, while among the illustrations were a well chosen series of typical feathers from ducks' nests. Yet the Editors were simultaneously busy in preparing the "*British Birds Marking Scheme*" which was launched in January 1909 and reached by November a total of nearly 2,200 ringed birds, of which the first showing movement was a Ravenglass Sandwich Tern (*Sterna sandvicensis*) recovered over 30 miles north of its breeding-place after seven weeks.

It will be clear from these quotations and examples that Witherby and his colleagues were not guided merely by luck in finding so quickly so many of what were to prove the main growing-points of British ornithology over the ensuing half-century. They understood that their task was not just to provide a receptacle for such contributions as happened to arrive, but to study the long-term needs of ornithology, and to inspire a gifted team of contributors to explore the most important problems and to bring out their hidden significance. They also recognized the latent potentialities of the many who wanted to watch birds creatively, but did not know how to go about it. One striking example of this striving was a six-page paper, called "The Bird-Watcher's Guide", by F. B. Kirkman, published in June 1910, listing a large number of questions deserving study, including some suggested experiments.

The broadening of scope was assisted by the addition to the editorial ranks in June 1909 of F. C. R. Jourdain and of N. F. Ticehurst, who has now been an editor for 48 years.

The seed so well chosen and so lavishly sown grew in so many different ways that to follow them would lead us into nothing short of a history of modern British ornithology. We must content ourselves here with having given something of the flavour as well as the purposes and personalities of the creative opening years. In 1914 papers in June on "The Study of Bird Notes" (from Germany) and in August on Avocets (*Recurvirostra avosetta*) in Holland and on "Ringing Birds in Hungary" were opening out European horizons when the First World War broke. S. E. Brock's path-finding paper on "Ecological Relations of Bird Distribution" in July, followed up by H. G. Alexander six months later, marked the end of peaceful progress.

The spate of Obituaries and an inevitable falling off in quality reflected the impoverishment of vigour from the disastrous losses of 1914-18, which have not been fully made good even yet. In January 1917 *The Zoologist* ended an honourable career of 113 years and was incorporated in *British Birds*. The Editors regretted the impossibility of covering *The Zoologist's* other natural history interests, which have undoubtedly been the poorer for its loss. They proposed, however, to admit a limited number of articles and notes on birds of Europe and North-West Africa as a slight enlargement of scope. In December 1917 Lieutenant H. F. Witherby, R.N.V.R., had temporarily to relinquish the Editorship to F. C. R. Jourdain, owing to war service abroad. While vol. ii had reached 444 pages, vol. xi fell short of 300 and even ten years later the pre-war size had not been fully regained, although the "*British Birds* Census of Heronries" required two 64-page issues for E. M. Nicholson's Report in April-May 1929.

It was only in vol. xxix that the 400-page level was attained again, in 1935-36, when the preparation of the monumental



*Handbook* was already absorbing much of the Editorial effort. Its successful completion proved indeed to be the greatest and final new contribution of the original team, which suffered the loss in February 1940 of F. C. R. Jourdain. He was replaced by B. W. Tucker. Already in vol. xxxiv, for 1940-41, *British Birds* was reduced to 274 pages, but worse was to come. Vol. xxxvii, in 1943-44, fell to 248 pages, the lowest ever, and fourteen of these were devoted to the bitter news of Harry Witherby's death in December 1943 and to the chronicle of his achievements.

Owing to the war, his contribution was never fully assessed, and perhaps it never can be, for it was not only immense but pervasive and incalculable. It can only be noted here that Witherby was much more than the Editor of *British Birds*; he was also one of the most prolific contributors, the leading consultant on many specialist aspects covered by his equally impressive collection, library, memory and first-hand experience, and he was his own printer and publisher. No other man could ever replace him either in span of ornithological experience or in span of control over everything connected with the preparation, production and distribution of *British Birds*. All kinds of problems, down to the elementary one of getting each issue out on time, could never again be settled as readily and decisively by one mind.

B. W. Tucker took over the Editorship for which he had been intended, and was joined by A. W. Boyd in March 1944. In 1946 the volume period was changed to coincide in future with a calendar year, and the panel of honorary consultants, originated in June 1944 with the co-operation of H. G. Alexander, W. B. Alexander, Miss E. V. Baxter, the Hon. G. L. Charteris, R. Chislett, Sir Hugh Gladstone, G. R. Humphreys, G. C. S. Ingram, N. B. Kinnear, Lt.-Col. R. F. Meiklejohn, Miss L. J. Rintoul, B. B. Riviere, Lt.-Col. B. H. Ryves, H. N. Southern and Dr. (now Sir) A. Landsborough Thomson, was increased by the addition of D. Lack, E. M. Nicholson and Major W. M. Congreve. With this volume began the series of "Studies of Some Species Rarely Photographed", H. N. Southern's Rough-legged Buzzards (*Buteo lagopus*) being the first. Among other features of Tucker's brief editorship was the much increased attention given to Local Bird Reports, which he had done so much to initiate, and to the Notes which streamed in on a greatly increased scale from many old and new observers.

With the Special Supplement on "Birds of the North Atlantic" vol. xli, for 1948, beat all previous records, reaching 450 pages with 70 Plates—an astonishing performance for an already mortally-ill Editor, working part-time with no full-time staff, in difficult post-war conditions. In January 1949 increased work and correspondence rendered essential the finding of a trustworthy lieutenant, and the choice fell on J. D. Wood, who, although him-

self a busy schoolmaster, took over most of the routine editorial work and correspondence. In this year also, the use of the trinomials and of English names for subspecies not identifiable in the field was discontinued, the change being explained in Tucker's important paper on "Species and Subspecies: A Review for General Ornithologists". It seemed that the great setbacks inflicted by the War and by the loss of Witherby and Jourdain were in sight of being overcome, when the fatal nature of Tucker's recurrent illness became unmistakeable and he died, still in harness, in December 1950, aged only 49.

Even the cautious and far-seeing Harry Witherby had never contemplated so calamitous a double blow to the Editorship within a single decade. As has been seen above, *British Birds* was no ordinary scientific journal, sifting such contributions as might offer in its own field, nor was it an ornithological society with a roll of officers and committee members to fall back upon, nor on the other hand was it a commercial project governed primarily by business considerations. It was, and still is, conceived and directed as a Trust on behalf of British Ornithology, with a peculiar responsibility for raising standards, for encouraging the advancement of knowledge about British birds in all its many aspects and for maintaining the continuity of editorial experience and tradition, not merely for the magazine but for the series of standard works represented by *The Practical Handbook* and *The Handbook*. The emergency demanded that the few survivors who had worked with Harry Witherby enough to absorb his objectives and methods, and had also been close to Bernard Tucker in his post-war labours, should rally round not only to avoid an immediate interruption, but to work out ways of ensuring that so far as humanly possible such a grave threat to continuity and standards should not be able to occur again.

The new editorial board broadened and formalized the team principle which had been implicit from the beginning, and produced an immediately improved spread in both age and range of experience, although nothing could compensate for a number of the personal qualities and scientific and other experience which had been lost. At the request of the publishers, E. M. Nicholson took over the responsibility as Senior Editor, and W. B. Alexander (then Librarian at the Edward Grey Institute) and P. A. D. Hollom (Editor of *The Popular Handbook of British Birds*, initiated by H. F. Witherby and B. W. Tucker) joined A. W. Boyd, N. F. Ticehurst and J. D. Wood on the Editorial Board. Despite their loss, they were able to produce vol. xlv with 440 pages and 1 coloured and 76 half-tone plates and to initiate, in co-operation with Editors of Local Bird Reports, new and improved arrangements for verifying and publishing "Sight Records of Rare Birds", described in the issue for January 1952.

Immediate efforts were also made to broaden the spread of subjects covered by contributions, which had suffered some narrowing

as a result of war and post-war conditions and the interruption of contacts. Unfortunately, a further interruption was suffered in 1952 when J. D. Wood was compelled to resign from the Board as he had accepted an overseas post; he was replaced by I. J. Ferguson-Lees, who, in view of the ever mounting volume of work on production and correspondence became full-time Executive Editor from October 1954.

In 1953 *The Handbook* order of arrangement of birds on the British List was abandoned in order to keep in line, so far as practicable, with the revised "Wetmore" or "Gadow-Peters" Order beginning with the divers (Gaviidae) instead of the Passerines, which had simultaneously been adopted by the British Ornithologists' Union. A number of changes in English names were adopted at the same time, some of which caused controversy. On this occasion also the great help which had long been freely given by G. K. Yeates in connection with the illustrations was recognized by his joining the board as Photographic Editor.

Older readers, and probably some of our more recent ones, may wonder why some of their notes, which would certainly have had their place in earlier volumes, can no longer be published in *British Birds*. Room for many of these will be found in the now numerous local bird reports, and it must be remembered that a general increase in knowledge, together with the growth in the amount of correspondence, has forced the Editors to be altogether more selective in the choice of short notes and in the recoveries of ringed birds that are published. This is not to imply that these short notes are not welcome. The Editors regard them, as did Witherby, as a most valuable part of *British Birds* and it is hoped shortly to devote more space to them again.

In 1955 vol. xlviii ran to 591 pages, including the greatly improved and amplified Index (by Miss N. D. Giffard), which the growing problem of tracing references demanded. The subscription rate was now raised from 25s. to 30s., compared with 20s. in 1907 for a volume with 186 fewer pages of text and about sixty fewer pages of plates. This expansion of the magazine did not unfortunately lead to sufficient rise in circulation to make possible the absorption of the steep addition to costs following the dispute in the printing industry which paralysed *British Birds* in common with many other periodicals in 1956. To the great regret of both Publishers and Editors the subscription rate had to be raised once more in January 1957.

Deplorable as this necessity has been, it is imposed on us by the state of the national economy and in so far as the Publishers and Editors are concerned they are entitled to ask readers to bear in mind that the decline in the value of money more than accounts for the increased cost of *British Birds* now as compared with fifty years ago, during which the number of text-pages, plates and contributions provided for subscribers has greatly increased. This



has only been possible, of course, because there are more subscribers, and while we sympathize with the straits of those subscribers who have felt obliged to give up their subscriptions and to become borrowers, it is a plain fact that if all who regularly read *British Birds* would regularly buy it the rise in cost falling on those who do buy it could have been reduced and perhaps wholly avoided.

If ornithology is to have first-class journals, those journals must be able to count upon adequate financial support. Bearing in mind the much higher outgoings inseparable from alternative outdoor recreations such as sailing, fishing, shooting, golf or photography, it seems not unreasonable to expect that many more of those non-subscribers who rely directly or indirectly on skilled ornithological services should pay their appropriate dues. In this connection it should be mentioned that *British Birds*, in common with other ornithological institutions has, in addition to its own heavy tasks, to deal with a steady stream of requests for free help, information and advice, representing an appreciable proportion of the editorial correspondence, now exceeding 5,000 letters annually. If every non-paying enquirer would pause a moment to reflect on the cost of answering these requests, as we always strive to do, and would subscribe accordingly, readers and Editors alike would enjoy great improvements.

Although the support of the faithful does not cover the full extent of the need for adequate resources, it is none the less deeply appreciated by those who have to carry on this exacting Trust from the past to the future. It is the steady confidence, the ever-growing co-operation and the understanding and tolerance of our readers which encourage us to meet the monthly task. Here we must particularly mention the most agreeable and deeply appreciated messages which we print in this issue from our fellow Editors in many countries, to mark our fiftieth anniversary. In some the praise is such that we find it difficult to recognize ourselves, but we accept it in the spirit of an acknowledgement to our predecessors who established the *British Birds* tradition which we endeavour, as best we can, to maintain and to develop.

Our editorial on this occasion is in form retrospective, but it outlines nevertheless some of the leading ideas which are in our minds for the future. The course we have set ourselves to follow is one of the most difficult, as it rejects either living in or renouncing the past. On the contrary it seeks constantly to use the still vital inheritance from the past as a guide and inspiration for exploring the future. The changes which we must make from time to time will be made in this spirit, never forgetting Harry Witherby's words:

“there will always be more to learn, not only for us, but for those to come—for the half has not been told”.

## 50th ANNIVERSARY MESSAGES

FURTHER to mark our 50 years of continuous publication, we invited comments from a number of distinguished ornithologists, chiefly Editors of other journals, both in this country and abroad. Below, we print a selection of the replies we received.

### Belgium

From M. le Président de l'Institut royal des Sciences naturelles de Belgique and from *Le Gerfaut*

LE PATRIMOINE de l'Institut royal des Sciences naturelles de Belgique et la Revue belge d'Ornithologie *Le Gerfaut*, expriment leurs vives félicitations aux éditeurs du périodique *British Birds* à l'occasion du cinquantième anniversaire de la fondation de cette revue.

Celle-ci a toujours été un guide sûr et averti, non seulement pour les ornithologues de Grande-Bretagne, mais aussi pour ceux du monde entier. Elle a toujours veillé à l'agrément et suscité un intérêt constant par la variété des sujets traités scientifiquement ainsi que par la qualité de l'illustration qui passe, à juste titre, pour être à l'avant-garde dans le domaine de la réalisation technique.

Le Patrimoine de l'Institut royal des Sciences naturelles de Belgique et *Le Gerfaut* forment les meilleurs vœux pour que la revue *British Birds* puisse continuer longtemps encore à paraître avec le même succès bien mérité.

E. LELOUP

### Canada

From the Director of the Delta Waterfowl Research Station

ENTHUSIASM for this great journal is expressed at Delta in many ways, at many times. Our work with waterfowl is a year-round analysis of studies afield. Since the end-product of all field-study is a synthesis of the author's observations braced against the thinking of his colleagues, we count heavily on the maintenance of wide associations via the technical journals. Our marshland is 400 miles from the nearest good bird-library, and we are isolated from visitors half the year; hence we have learned to count especially on the monthly arrival of *British Birds* as our most regular stimulus. Whatever the problem or the season, this distinguished journal, with its high editorial standards and its wide circle of contributors, seems always to present some discussion that is precisely to the point of our current interest, bringing from overseas a perspective that suddenly places us in better view of our subject. This monthly inspiration of *British Birds* is vital to the programme of the Delta Waterfowl Research Station. The fifty years of publication give a solid foundation for the important work lying ahead of us in the continuing study of American waterfowl.

H. ALBERT HOCHBAUM

From Professor William Rowan, D.Sc., F.R.S.C., a  
former contributor

It is a great pleasure to contribute a few words to this memorial issue of *British Birds*. Perhaps the reasons may interest you. It seems—although I never realized it till now—that I must have been one of the initial subscribers, for my earliest bound volume is dated 1907 and apparently the first issue appeared in June 1907. This was just before I deserted school (1908) to go “cow-punching” in Canada’s wild west. That I was a youngster without financial resources you can take for granted: I certainly was, and magazine subscriptions were a veritable luxury. My very first indulgence was *British Birds*. When I came to settle permanently in Canada as founder and head of the Department of Zoology in the University of Alberta in 1920, scientific journals of wider fields had to receive priority and in 1929, 22 years after I had started, I regretfully ceased subscribing to *B.B.*, for the birds of England by then seemed very remote. I am now the victim of some 40 scientific magazine subscriptions, although a small retirement pension has necessitated a very drastic axe! To commemorate this occasion, I am once again subscribing to *B.B.* for I can now indulge in the satisfaction of reading for nothing more important than pleasure.

The founder of *B.B.*, the late H. F. Witherby, and I early became personal friends. Witherby was a man after my own heart—thoughtful, generous and helpful. I shall continue to think of him with untarnished esteem, and it is with peculiar pleasure that I now return to the fold as a subscriber to his original baby, *British Birds*.

I have always been critical of journal editorship. *B.B.* appeared to me to be excellently and discriminately edited, and it is quite possible that my “soft spot” is due to this distinction. In any case, in my penurious retirement, I am returning to my first love. And much will I enjoy it!

WILLIAM ROWAN

### Czechoslovakia

From the Director of the Krajske Museum, Trnave

WE CAN only simply say that your magazine is the best in the whole of Europe and that it contains papers of such scientific worth that it is indispensable for every serious working ornithologist. We are very pleased that the exchange-relationship between *British Birds* and *Sbornik Krajskeho Muzea v Trnave* will in future be regularly established, and we shall send you all our further publications.

F. MATOUSEK

### Denmark

From the Editor of *Dansk Ornithologisk Forenings Tidsskrift*

ON BEHALF OF the Danish ornithologists and as Editor of *Dansk Ornithologisk Forenings Tidsskrift* I beg you to accept my most



sincere congratulations on the 50th anniversary of *British Birds*.

When your magazine was started there was a strong demand among English people for a more intimate knowledge of nature, particularly of bird-life, in their home country. This was no doubt aroused by the steadily increasing industrialization and urbanization which, so to speak, shut nature out from the inhabitants of the big cities. The late H. F. Witherby had the foresight to understand this, and by founding and directing *British Birds* he gave the growing ornithological interests a standard-bearer.

From the beginning *British Birds* was of a high quality. Not only local news were issued in it, but also important scientific contributions, like the publication on recoveries of ringed birds and the many studies of life-habits of single species.

It appears to me that *British Birds* has reached a peak in recent years, with the many papers of high value dealing with ethology and ecology. All ornithologists will express the wish that *British Birds* will continue to maintain this high standard of which British ornithologists can be proud.

FINN SALOMONSEN

### France

From the Editorial Committee of *L'Oiseau et la Revue française d'Ornithologie*

TOUS NOS COMPLIMENTS et nos vœux de prospérité à l'excellente revue scientifique *British Birds*, qui, en célébrant le cinquantenaire de sa fondation, témoigne de l'ardente activité qu'elle a su entretenir depuis un demi-siècle parmi les ornithologistes de Grande-Bretagne. Elle a su, entre autres, en faisant une part équitable à chacune des tendances que manifestent actuellement les études ornithologiques, rendre celles-ci accessibles à tous, tout en leur maintenant un caractère scientifique exempt de vulgarisation triviale. En préconisant aussi d'ingénieuses et inoffensives méthodes de capture sans préjudice pour la vie des sujets, elle a favorisé le goût et la protection des oiseaux sans restreindre le libre champ laissé à la curiosité légitime des observateurs. La coordination des résultats dans notre connaissance de la faune locale de Grande-Bretagne lui doit beaucoup: on peut souhaiter de même une coordination aussi étroite dans les recherches entreprises avec les pays continentaux voisins, en particulier lors des enquêtes relatives à certaines espèces migratrices ou erratiques. Bien présentée, illustrée de photographies souvent excellentes et toujours instructives, nous lui souhaitons sincèrement de continuer ainsi son heureuse carrière.

J. BERLIOZ

From the Editors of *Alauda*

LA DIRECTION d'*Alauda* est heureuse d'adresser ses compliments aux Editeurs de *British Birds* à l'occasion du cinquantenaire de

sa fondation par l'ornithologiste de grande valeur que fut H. F. Witherby. Durant ce demi-siècle la Science est redevable à *British Birds* d'avoir contribué par ses publications à éclaircir certains aspects de la biologie et de l'écologie, et à avancer l'étude de la migration des oiseaux: la publication des résultats du baguage pratiqué dans les Iles britanniques est une documentation essentielle pour l'étude de la migration. L'esprit critique qui a présidé à ces publications fait grand honneur à la Direction de *British Birds*, car naturellement les données ou observations insuffisamment contrôlées risquent d'être plus nuisibles qu'utiles. La publication, récemment instaurée, de photographies d'espèces intéressantes, offre également un grand intérêt documentaire. La Direction d'*Alauda* ne peut que souhaiter à *British Birds* longue prospérité dans la voie actuelle.

NOEL MAYAUD

### Germany

From the Director of Vogelwarte Helgoland and Editor  
of *Die Vogelwarte*

ON THE COMPLETION of its continuous publication for 50 years, I should like to express my warmest congratulations to *British Birds*, and to its capable Editors. This journal, which originally set the discussion and examination of only British species as its object, has developed during the 33 years of my closer acquaintance with it into a valuable scientific organ whose significance reaches far beyond the limits of Great Britain. Ornithologists of all countries will find very interesting and important information in this many-sided magazine, with its monthly publication, that cannot be appreciated highly enough. The opportunity should be taken to thank all those who render the publication of *British Birds* possible. With best wishes for the future flourishing of this interesting and outstanding journal.

RUDOLF DROST

### Great Britain

From the Editor of *The Ibis*

I HAVE always felt that the editing of *British Birds* must be more exacting than that of *The Ibis* in several respects. Perhaps the least important of them is the fact that *B.B.* is a monthly with a strictly limited space, with all that that implies. What does call for special qualities and scholarship is the fact that *B.B.* is primarily designed to deal with a geographical section of ornithology that is comparatively well worked; which means that critics are more numerous and avid. Most demanding of all is the flood of short communications, a large proportion of which raise difficult problems of selection and require meticulous technical examination. All of which makes me feel the more respectful to those who maintain *B.B.* at a high level of accuracy, do their best to avoid the general being swamped by the particular, and keep their heads on their shoulders.

R. E. MOREAU

From the Editor of *Bird Study*

ALL EDITORS believe that their tasks are superhuman, but a moment's reflection will suggest that their readers' tasks are even more formidable, so great is the yearly output of printed words even in a small field like ornithology.

Therefore, some division of the field of endeavour has been inevitable and most countries can now sustain more than one bird journal. Similarly, readers are coming to realize that, apart from subscribing to the journal, or journals, which suit their interests best, they need to pick and choose even among the fare offered by one journal.

Such specialization by editor and reader has had a curious and interesting result in the "hybrid vigour" shown where two fields of investigation overlap, e.g. ecology and behaviour, genetics and systematics, and so on. It is the virtue of a journal devoted to a particular group of animals that it acts as a meeting place for different subjects and approaches and so to the possibility of the kind of fruitful fusion mentioned above; *British Birds* has been pre-eminent in this way from the beginning. The appearance of new bird journals is at once a tribute to the good work done by *British Birds* and an opportunity to widen this "meeting-place" function by each journal's taking a slightly different standpoint.

H. N. SOUTHERN

From the Editors of *The Scottish Naturalist*

IN SENDING our congratulations and good wishes to the Editors on this important anniversary, we are naturally very mindful of the pre-eminent part which *British Birds* has played in fostering and shaping our national brand of ornithology in the last fifty years.

In the first Editorial in June 1907 the possibilities were foreseen of getting a large body of amateur contributors to combine in directed scientific undertakings. Of all those classic studies which have since been sponsored, none can have been more important or successful than the national "Marking Scheme", transferred twenty years ago to the British Trust for Ornithology. The B.T.O. itself, if not directly the product of the magazine, must principally owe its foundation, and in about equal shares, first to the enterprise and generosity of the three outstanding men who have successively been chief editors of *British Birds*, and second to the ready support of which the Trust was assured from the magazine's ardent and well-schooled readers.

In addition to this, *The Practical Handbook* and *The Handbook*, successively the most indispensable and powerful tools of the British ornithologist's trade, have sprung from exactly the same roots, and, at least in my own mind, are inseparably linked with the magazine.

We are glad to express our warm regard and gratitude to a contemporary esteemed for so many years, and to wish that its vigour and admirable influence will very long continue.

V. C. WYNNE-EDWARDS



## From the Director of the Wildfowl Trust

WITH THE HALF-CENTURY of *British Birds*, one cannot help thinking of its founder, the late H. F. Witherby. My first association with him was when as a boy I had carelessly identified a Ruff as a Yellowlegs because it had yellow legs, and had written a short note for *British Birds* which, needless to say, was not accepted. It took so long to live down this error that the discoveries which ultimately led to the description of the Greenland race of the White-fronted Goose were at first quite unacceptable to the great man. It was only when he had a pink bill feeding from one hand and an orange one from the other, during a visit to my pre-war lighthouse home, that he finally consented to a tentative footnote in *The Handbook*.

Since that unfortunate Ruff, my principal contributions to *British Birds* have concerned rare birds—an Alpine Swift, lots of Lesser White-fronted Geese, a plate of the North American Black Duck and the Ring-necked Duck—both new to the European List (the Ring-neck first spotted by my wife from my studio window).

Nowadays the occurrence of vagrants is regarded by many ornithologists as of little scientific significance—rare birds are rather *démodé*. But still, for thousands of us they provide a thrill which we occasionally experience at first hand, and more frequently, enjoy vicariously through the agency of *British Birds*. To that extent bird-watching has become a delightful game, and what fun to read how others have scored.

But whether it is recording rare birds or occupied with the more serious aspects of modern scientific ornithology, may I say “thank you” for the enjoyment which *British Birds* has brought me down the years, and wish it all good luck for its next half-century.

PETER SCOTT

## From Julian Huxley, M.A., D.Sc., F.R.S.

IT IS ALARMING to realize that my ornithological memories go back to a time when articles on British birds had to be published in *The Zoologist* or similar periodicals. The new channel provided by the founding of *British Birds* was a very real stimulus to the study of birds in this country, serving to bring together zoologists, ornithologists, naturalists, and bird-watchers, and it rapidly became indispensable both for the professional and the amateur student.

An analysis, year by year, of the papers and notes published in *British Birds* under various headings, such as ecology, records, reproduction, census, behaviour, and migration, would give an interesting picture of the development of bird study in Britain.

Looking back over fifty years, I would say that the high standard set at the beginning has been not only maintained but raised. I only wish that I could still be there when *British Birds* celebrates its next fifty years of active existence! JULIAN HUXLEY

### Holland

From the President and Secretary of the Nederlandse Ornithologische Unie, and the Secretaries of the Editorial Committees of *Ardea* and *Limosa*

THE COMMITTEE of the Nederlandse Ornithologische Unie and the Editors of their journals *Ardea* and *Limosa* take pleasure in rendering their sincerest appreciation to the Editors and Publishers on the occasion of the 50th anniversary of the publication of this journal, which, through the expert activities and enthusiasm of its founder, the late H. F. Witherby, has carried so worthily the challenging name of *British Birds*. We feel that *British Birds* has contributed much to the understanding of ornithologists far beyond the frontiers of Britain, and we are much looking forward to the continuation of this valuable journal.

L. F. DE BEAUFORT, M. J. TEKKE, G. C. A. JUNGE  
and G. C. B. TEN KATE

From Dr. G. A. Brouwer of the Rijksmuseum van  
Natuurlijke Historie, Leiden

IT WAS in the years 1918-20 that our unofficial club of bird-watchers (teen-agers with a special interest in bird-migration) were able to profit by the restored communications at the end of the First World War. Among the foreign ornithological literature the magazine *British Birds* held an honoured place: we obtained not only all the back volumes, but also the most important items among the literature on migration that were referred to in it; for example, W. E. Clarke's *Studies in Bird Migration* and the reports of the B.O.C. Migration Committee (1906-14).

Looking through the first volumes of *British Birds* once more (vols. i-xv), I find that many papers come to my memory again: the 1909 irruption of Crossbills (*Loxia curvirostra*) illustrated with maps, the "new" British Lesser Black-backed Gull (*Larus fuscus britannicus* = *graellsii*), the effects of the hard winter 1916-17, the ornithological notes from Norfolk, etc. But one paper especially attracted my attention at that time—Annie C. Jackson's "Moult of British waders" (vols. xi and xii). It formed a key to the large flocks of non-breeding Oystercatchers (*Haematopus ostralegus*), Knots (*Calidris canutus*), Dunlins (*C. alpina*), Bar-tailed Godwits (*Limosa lapponica*), etc., living in the Dutch Waddensee during summer. Later on, the investigations, among others by G. J. van Oordt (1928, 1931) and Jan Verwey (1927, 1930), on the gonads of these summering birds, brought the relation between maturity and breeding-dress to light.

Only once did I see the late H. F. Witherby and that was during the VIIth International Ornithological Congress at Amsterdam in 1930. I remember then that Witherby was so interested in the Cormorants (*Phalacrocorax carbo*) that circled above the Heronry

(*Ardea cinerea*) at "Gooilust", that he looked straight up at these birds at the very moment the group of members on the flight of steps of Mr. Blaauw's mansion was photographed. The photograph in question can prove it!

G. A. BROUWER

### Hungary

From the Assistant-Professor and Librarian at the  
Hungarian Institute of Ornithology, Budapest

THE HUNGARIAN INSTITUTE of Ornithology feels honoured to take part in the Jubilee of *British Birds*. The Institute has had from the beginning a lively connection with this valuable magazine, an exchange between it and our publication *Aquila* having been immediately arranged. The goals of *British Birds* and our Institute were the same: the ecological study of birds.

This relationship became more vivid after the visit, in the spring of 1914, of the late H. F. Witherby, who made many trips with our late Director, James Vönöczky-Schenk, in different regions of Hungary, to study bird-ringing. After an interruption in the First World War, many of the leading British ornithologists had the kindness to visit us, including Miss Phyllis Barclay-Smith, Dr. John Berry, Mrs. M. D. Brindley (Miss M. D. Haviland), the late Arthur Brook, Major W. M. Congreve, the late T. A. Coward, Capt. H. A. Gilbert, Walter Higham, etc. Many of them made important discoveries among Hungarian birds. For example, F. C. J. Waydelin proved the breeding of the White-headed Duck (*Oxyura leucocephala*) on Lake Velence (N.E. Pannony) in the year 1896; and the Rev. F. C. R. Jourdain recorded the first breeding of the Great White Heron (*Egretta alba*) at the same place in 1936. The Hon. Guy Charteris, in the breeding-season of 1933, found a Short-toed Lark (*Calandrella brachydactyla*) here and its breeding on the Puszta Hortobágy (N.E. Hungary); he proved that the Dunnock (*Prunella modularis*) is not only a breeding bird of the Carpathians, but also nests in the Danube-Islands, Szigetköz (N. W. Pannony). In 1937 Kenneth Morris produced a clutch of *Larus argentatus*, proving with it that the Herring Gull was nesting on the small island of Zec off the N. Adriatic coast. C. G. Danford, with his Hungarian home, lives vividly in our memory, and also R. B. Lodge, from whom the first Hungarian bird-photographers learned much.

We, the Hungarian ornithologists, are happy that we can participate in the 50-year Jubilee of *British Birds*, from which we have always learned so much, and we hope that the relations between us become even stronger in future. We wish you many further Jubilees!

ANDREW KEVE

### Iceland

From the Director of the Museum of Natural History,  
Reykjavík

ON THE OCCASION of the 50th anniversary of *British Birds* I should



like to convey to the Publishers and Editors most cordial wishes for the continued development of their successful work and efforts to further the progress of ornithology.

Most of the bird-species inhabiting Iceland are also to be found somewhere or at some time in the British Isles and have been closely studied there in the past. During the last 50 years the results of these investigations have been published primarily in *British Birds*, the leading magazine devoted to birds on the British List. Consequently, *British Birds* constitutes a mine of information and an indispensable source of reference for all those engaged in ornithological work in Iceland.

Moreover, quite a number of valuable articles on Icelandic bird life have appeared in *British Birds*, for British ornithologists and bird-watchers have paid frequent visits to my country. They still continue to do so, although the sporting naturalists and egg-collectors of the 19th century have now been largely replaced by undergraduate students. However, all such visitors are welcome to Iceland and it is my hope that close and friendly co-operation may long continue between British and Icelandic ornithologists.

FINNUR GUDMUNDSSON

### India

From Dr. Salim A. Ali of the Bombay Natural  
History Society

I HAVE always greatly admired the sustained enthusiasm, effort and competence that have gone into the production of *British Birds*. It must certainly be a rare example of a magazine of such comparatively restricted scope being run successfully as a commercial venture over such a long and unbroken period. The only message I feel competent to offer is the hope that the magazine will long continue to flourish, which under the present panel of Editors there is every good reason to believe it will. SALIM ALI

### Ireland

From the Editor of the *Irish Bird Report*

WE IN IRELAND have always derived great benefit from *British Birds*. Until quite recently, with the appearance of an *Irish Bird Report*, there was in this country no journal or paper devoted expressly to ornithology. Many important papers and records of rare birds have found their place in *British Birds* as the most fitting place for them to appear.

From the very outset the importance was realized by Ireland's great ornithologist R. J. Ussher, who used the journal for his records from the very start. Others have followed suit.

Whatever politicians may think or do, there can be no doubt that Ireland is part and parcel of the same ornithological unit as Britain. Perhaps we should claim consideration as a subspecies,

but with little more reason than some attach, for instance, to the Continental and British Goldcrests.

*British Birds* has never considered rejecting our Irish records as outside their scope, nor disallowing ringing under the scheme that, like *British Birds*, was instituted by the late H. F. Witherby. For this we should be grateful. Without *British Birds* Irish ornithology would have been the poorer over the years.

Speaking for myself, and I feel sure for many others, I wish the journal many years of continued prosperity.

ROBERT F. RUTLEDGE

### Japan

From the Secretary of the Ornithological Society of Japan

THE ORNITHOLOGICAL SOCIETY of Japan wishes to express its hearty congratulations on the half-century of *British Birds*, which during that time has contributed such a great sum of knowledge and information. Our Society, which reaches its 45th anniversary this year, has chiefly concerned itself with the field of taxonomy. Recently, however, our younger members have naturally become seriously interested in ecological and ethological studies, so that the data from *British Birds* have thus been greatly needed. We are therefore grateful to you, the Editors, for kindly accepting our proposal for a regular exchange with our journal *Tori*.

NAGAHISA KURODA

### New Zealand

From the Editor of *Notornis*, for the Ornithological  
Society of New Zealand

ALTHOUGH New Zealand is geographically a long way from Britain, many of your birds are our birds, both naturally and by deliberate introduction; so that it is not surprising that *British Birds* has its keen readers even in this distant Dominion. To many Britons scattered about the globe, *British Birds* remains the model of what an ornithological periodical should be, authoritative, scholarly, well-illustrated, broad in scope and including the work of both the professional scientist and the discriminating amateur.

We are happy to congratulate *British Birds* on the completion of fifty years' publication; and we are confident that its high standard of critical, and at the same time readable, writing about birds will be maintained in the years to come.

R. B. SIBSON

### Norway

From the Curator of the Stavanger Museum and  
Editor of *Sterna*

I WISH we had a Norwegian magazine like *British Birds*. If so, we would certainly know much more about our own avifauna than we actually do, and we would have had the means of linking up

all those interested in birds, who now live and work in almost complete isolation, each in his own corner of our rugged country.

As it is, we are more than glad to have *British Birds* to consult in order to see what is going on in the bird-world in our part of the globe, to get news of important new books, and see the condensed results of the painstaking and detailed work of our friends on the western side of the North Sea.

Norwegian ornithologists join me in presenting their thanks for what *British Birds* has meant to European ornithology in the past half-century, and we wish it continued progress for the years to come.

HOLGER HOLGERSEN

### Sarawak

From the Curator of the Sarawak Museum

WHILE still a lusty boy I lived at Addlestone, in Surrey, next to Philip Hollom. Influenced by the work of E. M. Nicholson, we spent much of some holidays counting Great Crested Grebes about poly-pond Surrey. First results appeared promising; so we boldly if nervously approached that great bird-man of the time, H. F. Witherby. In his bird-and-book-stacked Hampstead home he seemed at first awfully grim. Thin, very tweedy, severely authoritative and rather dry. But there was the reassuring roar of a sportscar and jazz records—from younger Witherbys, off stage.

After a sticky spell of reasoned suspicion about us adolescents, H.F.W. decided to back this second full-scale census of a British bird, generously; later publishing full results in *British Birds* (1931).

For myself, through him, I became bewitched with birds and a new magic of knowledge, individual yet organized. Although, unlike Phil Hollom, I have strayed far from the fold in later years, this love is always with me; thank goodness—and thank you! No other single person or the periodical he founded did so much to reorientate and revitalise western ornithology, which at that time was rather fading in the hands of the past; and failing to attract the young, because it was bogged down—to a large extent—in its own trivia, esoterica and effluvia. Ah, that we had a *Bornean Birds* as well . . . here.

TOM HARRISSON

### Sweden

From the President of Sveriges Ornitologiska Förening

SINCE THE WAR, interest in ornithology has increased very much in Sweden. All those interested in birds have turned to field-work and there has been some concern from the zoologists to make this great fund of enthusiasm fertile for the advancement of real knowledge, especially of the ecology of birds.

British trends in ornithological studies have been of great importance also for the development of Swedish research. Through



personal contact, but, I think, still more through the journals, British ornithologists have served as stimulating fore-runners and all Swedish ornithologists will pay their tribute to the importance of *British Birds* and the other journals in Britain. The popularity of *British Birds* is great and still growing, and we read above all the more general papers, on migration and breeding, and look at the fine portraits in the series of less familiar birds.

Swedish ornithologists give their best wishes for the next half of the first century and will also carefully follow the development of *British Birds* in the future.

SVEN HÖRSTADIUS

From the Editor of *Vår Fågelvärld*

IN SWEDEN, interest in the study of birds has been growing every year during the last two or three decades. Compared with Great Britain, however, we have only small ornithological traditions to found on, in spite of Linnaeus. Thus, I think, in building up Swedish field-ornithology of to-day, our way would have been much more difficult if we had not had the advantage of using *The Handbook, British Birds* and other British ornithological journals and books as rich sources of knowledge and learning. My colleagues and I, indeed, feel ourselves much indebted to the memory of H. F. Witherby and to his fellows and successors on the Editorial staff of *British Birds*. Your journal has given us much guidance for our own management of the comparatively young *Vår Fågelvärld*. We have always found the papers in *British Birds* of a high biological and faunistical value, while the notes are read with much interest, as also are the reviews and the letters from your readers.

With many thanks and best wishes for the new half-century.

GUNNAR OTTERLIND

From one of the leading Swedish bird-photographers

THE BRITISH birds are not only British. This and the fact that most contributions to *British Birds* are of general ornithological interest, even under a heading that at first sight suggests a locally limited subject, mean that the papers in your journal can be read with interest overseas, not least in Scandinavia. Personally I admire the rich variation of different subjects as well as the editors' ability consistently to find and select papers of the greatest interest associated with a highly concentrated form of delivery, a feature that encourages even a busy reader not to postpone absorbing the experiences and discussions presented.

Photographs are an international language, and the photographic studies may be seen as an ornithological expression of the old Chinese proverb "a picture tells more than a thousand words." The short notes, many of them looking like matters of curiosity, together through the years make a "fishing ground", interesting and useful for various specialists.

If a personal desire might be expressed, I would suggest more contributions to the study of the habits of British species in their winter-quarters where the conditions sometimes differ extremely from those of the British Isles.

In admiration and gratitude for fifty years of *British Birds*, I send my best wishes for the coming volumes.

PER OLOF SWANBERG

### Switzerland

From the Editor of *Nos Oiseaux*

I SHOULD NOT like to let pass the occasion of the 50th Anniversary of *British Birds* without expressing my congratulations and my admiration of the high quality of your magazine. Each number brings us something new, and I know that many of our Swiss colleagues who subscribe to it highly appreciate it, for the text as well as for the splendid photographic illustrations—which rise above the common-place that so many other publications offer us. Continental ornithologists are particularly impressed by the increased attention which their British confrères now devote to the published literature not only in their islands but beyond where languages are foreign to them. I know how much effort this represents, but I am sure it is well worth the trouble. Our science can only profit by a better international understanding and by a mutual regard between its adepts; the safeguard of that which is dear to us also depends on it.

The periodicals for which we are responsible have a great rôle to play in the exchange of ideas and research, and in working for a better understanding beyond their frontiers. It is therefore comforting to see that *British Birds*, in spite of its 50 years and although getting stouter, is looking younger and making friends everywhere! Who would not envy it? I send you my best wishes for your Jubilee.

PAUL GÉROUDET

From the Editor of *Der Ornithologische Beobachter*

A JOURNAL devoted to field-ornithology has the multiple task of contributing to the advancement of ornithological science, of amplifying the knowledge of the reader, of guiding the amateur to critical and scientific bird-watching and of stimulating activities in fields of actual interest. By the joint efforts of Editors and contributors the magazine *British Birds* has succeeded in becoming an outstanding model of this type of periodical, which is of fundamental importance for the development of ornithology on a broad and solid basis. Apart from the high standard of the papers we especially appreciate the excellent Editorial direction, the support given to teamwork and the care for vivid and fair discussion and sound criticism. We heartily congratulate *British Birds* on the celebration of its half-centenary and gladly take the

occasion to express our great admiration of its productive and stimulating work and the progressive influence which it exercises far beyond the limits of Great Britain.

ERNST SUTTER

From the Editor of *Die Vögel der Heimat*

ON THE OCCASION of your Jubilee I must express to you my most sincere appreciation of your very beautiful and valuable magazine. Please accept my very best wishes for its further prosperity.

E. GATTIKER

### United States

From the Editor of *The Condor*

MAY I WISH you every success with the publication of your fine journal. The best wishes of the Editors of *The Condor* go to you on this occasion.

ALDEN H. MILLER

From the Editor of *The Wilson Bulletin*

ONE of the auxiliary responsibilities of a journal in the natural history field is to provide leadership for the students of the field. This end may be achieved by giving a featured position to an article that might stimulate further investigation of a given topic. Occasionally the action may be more direct, through the use of Editorials or by the fostering of programmes of co-operative study. Throughout its half-century of existence, *British Birds* has provided direction to a host of amateur observers, for example, by the bird-ringing programme in the early days and, more recently, through the stressing of the reporting of behaviour patterns supplementing those described in *The Handbook*. The latter function has made reference to the contents of this journal mandatory for students of Holarctic birds. It is a pleasure, therefore, to commend the Editors and Publishers of *British Birds* on the occasion of this anniversary and to wish them continued success in their indispensable venture.

KEITH L. DIXON

From the Editor of *Bird-Banding*

THE first fifty years of *British Birds* bear eloquent witness to the progress field-ornithology has made in Great Britain. In many respects, the key to that progress lay in enlisting the interest and enthusiasm of amateur bird-watchers for serious studies. Without the sort of guidance and support which the Editors of *British Birds* have long afforded, it is still easy for the experienced amateur to contribute little or nothing to the science. The original and necessary task of becoming familiar with the appearance of birds may be succeeded by a sterile round of purposeless observation. To mention only one aspect of field-ornithology, *British Birds* has excelled in the publishing and evaluating of data supporting sight records of rarities, so that subsequent workers need not rely entirely on the *ipse dixit* of the original observer.

E. ALEXANDER BERGSTROM



From the Director of the Los Angeles County Museum

WHEN I was still very young, before the First World War, ornithology in Great Britain had reached a very high level. Prominent authors were describing hundreds of striking new birds procured by famous explorers in all parts of the world, and beautifully illustrated articles and books were constantly published. I was naturally much attracted by such glamorous achievements, and I soon became a friend of many of the great ornithologists of those days. H. F. Witherby was one of them. He had sensed that the work so far done on the native birds of Britain was insufficient. Modern observation of the local avifauna, of its migrations and living habits had just begun. He was responsible for a start in the right direction, and the periodical he had recently launched has done more for the advance of the study of British birds than any previous effort.

Now that most of my old bird friends have left us, I remember with pleasure the days spent among them in the by-gone years when Witherby was enthusiastically editing *British Birds*. It is a great comfort that his work is so well carried on by his successors. May it last and prosper for many years to come.

J. DELACOUR

### U.S.S.R.

From Prof. Dr. G. P. Dementiev of the Academy of Sciences of the U.S.S.R.

I HAVE THE HONOUR to send to the magazine *British Birds* my sincere congratulations and all best wishes in connection with its half-centenary of publication. Personally, I have been a regular reader of this journal for some 30 years. Every ornithologist has admired the well-known "*British Birds* Marking Scheme" which was started by the late H. F. Witherby, the founder of the magazine, and carried on by Miss E. P. Leach and many collaborators. This initiative marked a very great step forward in the study of bird-migration. But it seems of even more importance that the magazine has promoted numerous, detailed and excellent studies in bird-ecology. This was a great pioneer-work and let me draw attention here to the fact that it was only later that such well-known ornithological publications as *The Ibis* and *Journal für Ornithologie* started to pay attention to such studies. I think therefore that the rôle of *British Birds* far exceeds the limits of Great Britain and must be highly appreciated by ornithologists throughout the world. The very high level of ecological studies published in this journal causes me to hope that *British Birds* will remain a first-class source of ornithological knowledge for many years. Some suggestions for the future should be made. Is it possible to give—perhaps regularly—some considerations on the general problems of avian ecology? Is it possible to enlarge bibliographical notes?

On behalf of my colleagues in the Moscow University and in the Nature Protection Commission of the Academy of Sciences of the U.S.S.R., I express to the Editors of *British Birds* all best wishes for the future success and happiness.

G. DEMENTIEV

### Yugoslavia

From the Editor of *Larus*

AS WE INTEND to enlarge our *Larus* by giving short surveys of important articles in foreign ornithological periodicals, we have again scrutinized the last two volumes of *British Birds*. Far from any flattery, but all praise to the Editors! From the contents to the technical equipment, this publication belongs out of any doubt among the best ornithological publications of all. It is a pleasure to take some of its numbers, regardless which, in the hand. Therefore, it is very difficult to give any suggestions or criticisms, having a perfect publication in *British Birds*. By reading it, anyone can profit and get an insight in modern methods of ornithological work, where your nation has one of the leading rôles.

RENATA KRONEISL-RUCNER

## COLLARED DOVES IN NORFOLK: A BIRD NEW TO THE BRITISH LIST\*

By R. A. RICHARDSON, M. J. SEAGO and A. C. CHURCH

(Plates I and 41-42)

ON 3RD JULY 1956, M.J.S. was attracted by the unfamiliar trisyllabic cooing of two doves, one of which was seen, in the trees of a large walled garden near the sea in north Norfolk. Later, on consulting published descriptions and an illustration (Frugis, 1952; Fisher, 1953) of the Collared Doves (*Streptopelia decaocto*), he found they tallied very favourably with his field-notes.

In the weeks that followed either R.A.R. or A.C.C. were able to visit the site for varying periods almost daily and their observations, necessarily restricted owing to the very public nature of the site, are summarized below. Meanwhile, reports of similar

\*It will be recalled that in 1952 a single Collared Dove was found displaying at Manton in Lincolnshire (*antea*, vol. xlv, pp. 51-55) and that this bird, still alone, has reappeared every year since then (e.g., *antea*, vol. xlv, p. 307). The attendant circumstances, notably the fact that one of the two dealers who at that time had been importing this species lived only 30 miles away, at Pontefract in Yorkshire, were such that neither we nor the B.O.U. Records Committee could feel certain that the bird was a genuine wild immigrant; and all preferred to suspend judgement until further evidence of the species' arrival in this country in a free state might be forthcoming (see *antea*, vol. xlv, p. 55; and *Ibis*, vol. 98, p. 155). This evidence has now been provided by these Norfolk birds, about which our own enquiries have revealed no reason for doubts: there is no suggestion that anyone in Norfolk has imported Collared Doves and it appears that in any case none has been advertised by any dealers in this country since 1952. The coastal location and the numbers involved strongly

birds were received from a locality a mile and a half away on the outskirts of a small coastal town, all of which proved to be *S. decaocto* and not the domesticated Barbary Dove (*S. risoria*) that resembles it to some extent.

Intensive enquiries within the county and an appeal for information in the regional press have so far failed to produce evidence of "escapes" or liberated birds and there seems no reason to suppose that these Norfolk specimens are anything but genuine wild colonists from the Continent.

It is now known that birds were present at two of the sites in 1955 and that young were reared at one of them. By the end of the 1956 breeding-season at least sixteen birds, adults and young, were known to have been in the area. One pair wintered during 1955/56, and up to twelve birds during 1956/57.

#### SITE A

A large walled garden near the sea with extensive lawns, shrubberies of laurel and privet, evergreen oaks, pines, Spanish chestnuts, etc., and a poultry-run.

1955: Two or three doves resembling *decaocto* are reported independently by two reliable local people (though with limited ornithological knowledge) to have been present in 1955, but it is not known whether breeding took place or if any birds wintered.

1956: After initial "discovery" on 3rd July it became apparent from frequent visits to the garden that there were at least two support the belief that the Norfolk birds are genuine immigrants from the Continent and the species, therefore, may now reasonably be regarded as an addition to the British List (a decision that has been taken in conjunction with the B.O.U. Records Committee, according to our usual practice). (For what it is worth, it might be added that, of the members of the Committees concerned, the birds at Site A have been seen by E.M.N., W.B.A., I.J.F.-L., P.A.D.H. and Prof. M. F. M. Meiklejohn.)

To what extent, however, the new developments can be regarded as affecting the status of the Lincolnshire bird is a debatable point: in that case there is still the inescapable fact that imported Collared Doves—not to be confused with the commonly-kept, domesticated Barbary Doves (*S. risoria*)—were being sold at the time only an hour's flight away. Indeed, until the spread from Norfolk really gets under way, occurrences of single Collared Doves are perhaps best regarded with caution. In this connection there appears elsewhere in this issue (see pp. 270-271) an account of one seen in Surrey during April and May 1956.

It will, however, be worth keeping particular watch for this species when the birds spread from Norfolk, as they surely will when the numbers there build up. In addition to the field-notes in the present paper, a number of details of description, voice, habitat, habits and distribution are to be found in the references given here. We do not know of any startling changes in the distribution in Europe since the publication of James Fisher's extremely thorough and valuable documentation (*antea*, vol. xlv, pp. 153-181), but numbers have built up considerably in Holland, Denmark and southern Sweden during this time.

In conclusion, there must be some explanation of the choice of English name. Previous writers about this species in *British Birds* have used "Collared Turtle Dove", at our suggestion, but we now feel that both usage and brevity demand the adoption of the shorter "Collared Dove".—Eds.



males and one female in residence. Sexual and territorial pursuits occurred several times daily and cooing "song" by both males could be heard at almost any time of the day, though falling off somewhat in the early afternoon. Suspicion that the female was in fact paired with one of the males was confirmed on 29th July by the appearance with them of a fully-fledged juvenile.

On 12th August the male of the breeding pair was heard cooing from the depths of a *Cupressus macrocarpa* and was found to be incubating "hard set" eggs on a nest of typical dove construction about 25 feet from the ground. Both eggs hatched, the nestlings were ringed by A.C.C. for Cley Bird Observatory on 26th August and safely fledged.

Early on the morning of 14th September, while Eric Simms and G.F. Wade of the B.B.C. were making sound recordings of the birds, the existence of this pair's third nest was suspected when the male was seen to call the female from the nesting tree. It was not until the afternoon of the 20th, however, that the male was heard cooing in the *macrocarpa* and the slight rhythmical movement of his white-tipped tail betrayed the location of a very well-concealed nest about five feet above that in which the second brood was reared.

Both the third-brood nestlings reached the flying stage, thus bringing to five the total of young birds reared by this pair during the year. Four birds wintered, and two pairs and one odd bird were in residence in April 1957.

#### SITE B

1956: At the end of March a pair arrived in a garden on the eastern outskirts of the town; the nest was found in early April, 25 feet up in one of a belt of pines that flanked the garden on two sides and the shells of hatched eggs were later picked up beneath the tree.

Two young were reared before the site was deserted and it is possible that their parents were the birds which later nested a few hundred yards away at Site C.

(N.B.—We did not hear of this pair until after it had left Site B.)

#### SITE C

1955: A pair first appeared in a small garden in April and is known to have reared two young. Two birds wintered (1955/56) and in snowy weather came down to the lawn to feed on grain supplied for them by the lady of the house.

1956: One pair bred again in a 50-foot umbrella-shaped ilex tree and reared at least one youngster. An egg, near hatching, was found beneath the tree after a gale in August.

(N.B.—The presence of birds at this site was not made known to us until the third week of September.)

Within half a minute's flying time of sites B and C is a small

poultry run in the middle of a new Council housing-estate where, despite the presence of numerous dogs, cats and children, up to eight Collared Doves were seen feeding together on many occasions in early September. Seven were still present on 1st December, and twelve were counted in early February 1957.

#### CLEY

1955: One day during the late summer P. R. Clarke saw a "fawn"-coloured dove on an electric cable beside the coast road and understandably dismissed it as a *turtur* × *risoria* hybrid which had been at large in the neighbourhood a couple of years before.

1956: On two occasions during the late summer an unmistakable *decaocto* was seen in exactly the same place: firstly on 15th August by T. C. Smout and secondly on 9th September by Miss E. McEwen, both of whom had seen the breeding pair at Site A.

It seems likely that these birds were Norfolk-bred juveniles perhaps spreading along the coast from Sites A, B or C, rather than newly-arrived birds from overseas.

#### FIELD-NOTES ON THE NORFOLK COLLARED DOVES

##### *Habitat.*

Gardens in residential outskirts of coastal town, well-timbered with evergreen trees such as ilex, pines, etc. Proximity of poultry-runs for feeding purposes apparently essential and presence of prominent "look-out" perches such as telegraph-poles, electric cables and television-aerials seems important.

##### *Field-characters and general habits.*

A sandy grey dove, somewhat larger than Turtle Dove (*S. turtur*), with a narrow black half-collar, edged white, round back of neck; dark primaries and black and white under-tail surface,



FIG. 1—DISPLAY-FLIGHT OF MALE COLLARED DOVE (*Streptopelia decaocto*). When the bird is flying, particularly during display, the black and white under-surface of the spread tail is very conspicuous.



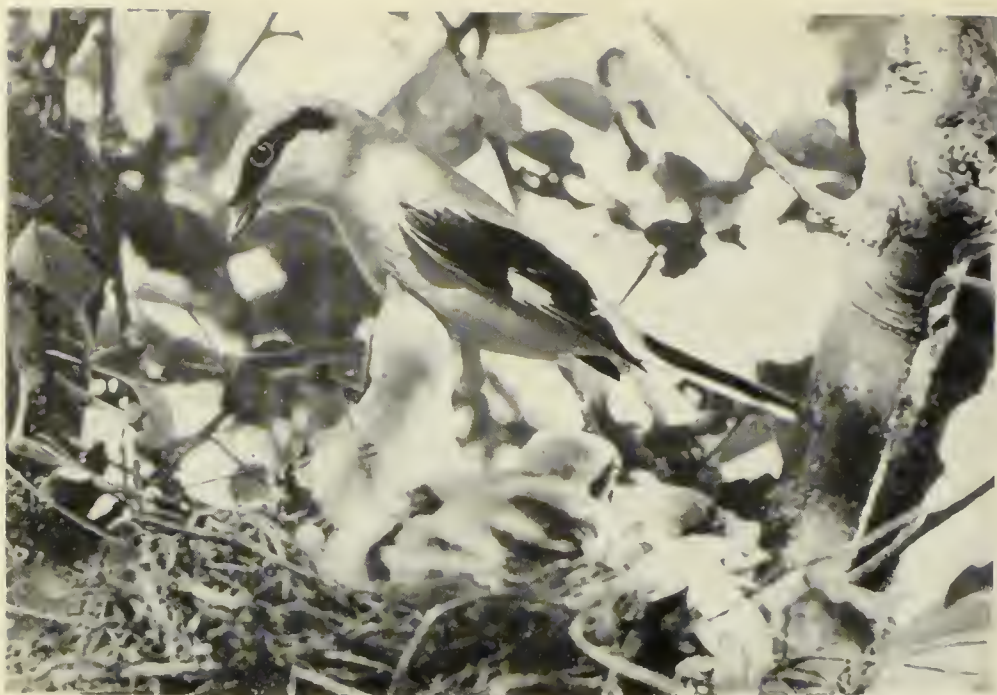


Eric Hosking

GREAT GREY SHRIKE (*Lanius excubitor*) AT NEST: COTO DONANA, SPAIN, 17TH MAY 1956  
 This gives a good general impression of this strikingly contrasted three-colour bird, grey above and white below with black eye-patch, wings and tail. Note the grey forehead, the white line above the eye, the white on the scapulars, and the long tail, that distinguish it from the Lesser Grey Shrike (*L. minor*), which also has a more upright stance and a more prominent area of white on the closed wing (see pages 250-251).







F. Götschi

GREAT GREY SHRIKE (*Lanius excubitor*) AT NEST: SWITZERLAND

The nest—rather bulky and quite deep, made of twigs, lined with rootlets, grasses and feathers—may be in a low bush or up to perhaps 40 feet high in a tree, in a main fork (as here) or at the end of a small branch (see page 252 and cf. plate 40).



F. Götschi

BROOD OF YOUNG GREAT GREY SHRIKES (*Lanius excubitor*): SWITZERLAND

There are six young in this nest, a normal brood, though in the north clutches of seven are commonly found. Juveniles are not unlike the adults, but browner above and marked with wavy bars below.



F. Gölttschi

"LARDER" OF GREAT GREY SHRIKE (*Lanius excubitor*): SWITZERLAND  
 As with other shrikes the habit of impaling prey on thorns in one regular place, thus forming a "larder", seems to be inconstant. In N. Europe, birds form a large part of the prey, but in the south lizards, small rodents, beetles, dragonflies, etc., are commonly taken (see page 252).



Eric Hosking

GREAT GREY SHRIKE (*Lanius excubitor*) IN FLIGHT: ENGLAND  
 This shows well the flight-pattern, and particularly the white line formed on the black wing by the white bases to the primaries and outer secondaries (see page 251). Note the long tail.





Eric Hosking

PAIR OF GREAT GREY SHRIKES (*Lanius excubitor*) AT NEST; COTO DONANA, SPAIN, 17TH MAY 1956  
 The unusual view of the rear bird emphasizes the lack of black on the forehead, and the white lines above the black eye-patches. The birds of Spain belong to the South European race (*L. c. meridionalis*) which is normally darker above and more pink-tinged below, but these differences do not show here; it also has a smaller, single wing-bar. This nest was 7 feet from the ground in an ilex oak, attached at the ends of two thin lower side-branches (see page 251).







*P. R. Clarke*  
NESTLING COLLARED DOVE (*Streptopelia decaocto*)

NORFOLK, AUGUST 1956

This was from the second brood at Site A (see page 240). Newly-fledged juveniles lack the black half-collar and, with their more uniform brown colouring and long-beaked appearance (due to the featherless base of the bill), may cause confusion. Note the under tail-pattern and the dark primaries.



*H. A. Crato*

A DESERT GREY SHRIKE—*Lanius excubitor pallidirostris*  
FAIR ISLE, 21ST SEPTEMBER 1956

Note the spread of white on the wing (cf. plate 39 lower), the general paleness and lack of contrast between crown and chin, the pale base to the bill, and the squarer-ended eye-patch which is also dusky rather than back on the lores (see page 246).





R. P. Bagnall-Oakeley

ADULT COLLARED DOVE (*Streptopelia decaocto*)

NORFOLK, 31ST OCTOBER 1956

Two views of the same bird on a tree in a chicken-run—a typical habitat. Note the narrow black half-collar edged with white (less conspicuous when the bird is hunched—see upper), the blackish primaries contrasting with the coverts, and the heavier build compared with a Turtle Dove (*S. turtur*). The bird is brown above, greyer on the rump, tail and forewing, and it has a marked pink flush below (see pages 239-246).





Eric Hosking

NEST-EXCAVATION BY BEE-EATERS (*Merops apiaster*)  
COTO DONANA, SPAIN, MAY 1956

The lower shows how a Bee-eater supports itself on carpal joints to dig by "pedalling" hard with both feet, using its bill to break down the sand in front (see pages 263-267). The sexes take turns, though often the female does the greater share, and in this case the resting bird began displacement-digging outside the hole. The upper illustrates the way in which ground-nesting Bee-eaters use any available projection as a perch (the bird is holding a Striped Hawk Moth, *Celerio livornica*).





Eric Hosking

BEE-EATER (*Merops apiaster*) AT NEST-ENTRANCE: COTO DONANA, SPAIN, MAY 1956

While one digs in the tunnel, the other waits impatiently at the entrance and stands right in the shower of sand being kicked out by its mate; it has to shake its head constantly to clear its eyes. Contact between the pair during digging is maintained by soft calling from both, and digging is usually interspersed with short flights and perching. In these level-ground colonies the holes are easily seen by the broad triangle of sand thrown out behind (see page 266).

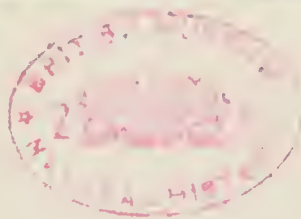




*Eric Hosking*

COURTSHIP-FEEDING OF BEE-EATER (*Merops apiaster*): COTO DONANA, SPAIN, MAY 1956

Courtship-feeding is frequent while the nests are being dug and is commonly followed by copulation. Male alights on skull with food (dragonflies, moths, beetles or bees) and calls to female in hole; when she appears and lands beside him (usually after a short flight), he feeds her several times in quick succession, after which coition takes place. These photographs give a good impression of the shape, stance and pattern of these vivid birds of blue, green, yellow, chestnut, black and white.







James Alder

DIPPER (*Cinclus cinclus*): TO ILLUSTRATE THE WINKING ACTION

A paper on the blinking or winking of this species appears on pages 267-269. On the left is shown the open eye, and the pale lower-lid which in some individuals is quite white and very prominent. On the right the bluish-white nictitating membrane is across the eye, giving a lifeless appearance, but it is the sudden showing of the otherwise-hidden white upper-lid as it closes that gives the effect of a blink at normal distances.

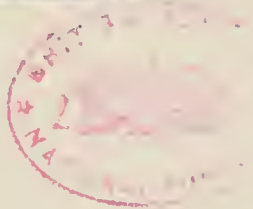


James Alder



DIPPER (*Cinclus cinclus*): TO ILLUSTRATE THE WINKING ACTION

On the left the upper-lid is almost closed, revealing quite an area of white, and the nictitating membrane is just visible between the black edges of the lids. The membrane, though it is bluish-white in colour and may always flick across the eye as it closes (see page 268), as well as at other times, is perceivable only at close quarters. On the right is shown a Dipper carrying food: note the prominent white lower-lid.



In the presence of a rival the male chivies his mate in the opposite direction (Fig. 3), using the threat note described above, and while in sexual pursuit he follows her with a rather weak, dragging flight. Young birds, when soliciting for food, work their wings with varying degrees of intensity (see Plate I).

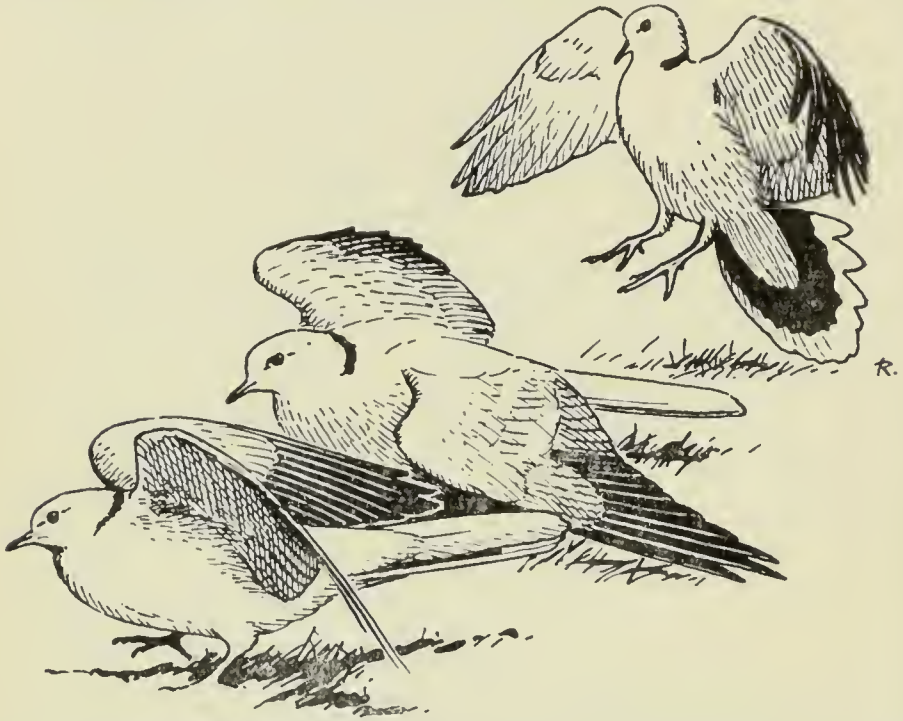


FIG. 3—MALE COLLARED DOVE (*Streptopelia decaocto*) CHIVVING HIS MATE AWAY FROM POTENTIAL RIVAL

In the presence of a rival the male drives his mate in the opposite direction, using the threat note as he does so.

### *Breeding.*

All known nesting-sites were between 25 and 50 feet up in pines or *Cupressus macrocarpa*. Nest more substantial than Turtle Dove's and rather like small Woodpigeon's (*Columba palumbus*). Eggs: presumably 2; white; none measured. Incubation- and fledging-periods not known owing to difficulty of observation and access.

Triple-brooded in one case. Season apparently April-September. Male incubates during day, from soon after sunrise to late afternoon; female at night. Male seems to take initiative in nest-relief, calling the female to the nest when his spell of duty is over and calling her off in the morning before flying to the nest himself.

### *Food.*

Very little is known except that grain fed to poultry is extensively taken. The crop of one half-grown nestling contained

a few grains of wheat. Birds also seen pecking about on newly-ploughed land, but whether feeding or seeking grit is not known. Drinks freely from bird-baths, rain-water butts, etc.

*Plumage description* (see Plate I).

Adult: Entire body-plumage sandy-grey strongly washed with blue-grey on the outer wing-coverts and under tail-coverts, and less so on the crown. A black half-collar round back of neck, narrowly edged with white. In fresh autumn plumage the breast is flushed with an exquisite vinous tinge. Primaries dark sooty, almost black at certain angles, but the exposed tips and edges bleach to light brown during the summer and caused us some anxiety over the identification in the early days of watching the birds. Tail-feathers sandy-grey on the upper surface, but black with bold white tips below. Outer feathers have white outer webs. Iris wine red; bill blackish; mouth rose-pink; feet "pigeon pink".

Juvenile: Apparently variable; one being distinctly washed with cinnamon and another of same parentage almost mousy-fawn. Dark neck ring present, though incomplete and usually very faint. Fawn body plumage and wing coverts have narrow pale fringes and blue-grey bases giving a two-tone and faintly patterned effect. (N.B.—The female of the breeding pair at Site A was in similar plumage and it was thought possible she was in first-summer plumage. Adults seem to undergo a complete moult in September.) Primaries and tail-feathers as adult. Iris olive-brown; feet lead grey.

#### SUMMARY

1. Two or three pairs of Collared Doves nested successfully in two adjacent localities in north Norfolk in 1956. At least two pairs were present in 1955, one of which bred. Two wintered, 1955/56.
2. Sixteen individuals, including young birds, were known to be in the area during 1956, twelve of which were present in early February 1957.
3. Breeding-successes at the three sites are described.
4. Single birds at Cley in early autumn may have been wandering Norfolk-bred juveniles.
5. Field-notes on the Norfolk specimens are given.

#### ACKNOWLEDGMENTS

Many observers have provided us with information and we are especially indebted to the following: E. Bastow, R. A. F. Cox, E. A. Ellis, C. R. Gurney, A. Jenkins, Rev. McMakin, I. G. Neave, Mr. and Mrs. G. W. Rook, Mr. and Mrs. C. Rounce, Mrs. E. Tuck and J. H. Woodhouse. P. R. Clarke kindly took



the accompanying photographs of one of the second-brood nestlings at Site A (plate 41 right); and R. P. Bagnall-Oakeley those of an adult seen at Kelling, Norfolk, on 31st October 1956 (plate 42). We are also grateful to I. J. Ferguson-Lees, James Fisher and Derek Goodwin for reading the manuscript and making helpful suggestions.

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 POST-SCRIPT 1957, Site A.—Two fully-grown juveniles seen together during first week of May.

## A DESERT RACE OF THE GREAT GREY SHRIKE, NEW TO THE BRITISH ISLES

By KENNETH WILLIAMSON

(Fair Isle Bird Observatory)

(Plate 41 left)

A FIRST-WINTER example of *Lanius excubitor pallidirostris*, variously known as Bogdanoff's Shrike (Dresser, 1895), Grimm's Grey Shrike (Dresser, 1902), and the Steppe Shrike (Edberg, 1954), was watched, trapped and examined in the hand at Fair Isle on 21st September 1956, the first occasion on which this form has been recognized in the British Isles.

With my daughter Hervör I was maintaining a watch over a group of Japanese mist-nets in crops and stubble on the afternoon of 21st September when a large and exceedingly pale grey shrike flew into the area and alighted on one of the mist-net supports. During the next hour we had it under constant observation, and were joined successively by R. F. Allison, M. F. M. Meiklejohn and (after the capture of the bird) H. A. Craw. At the Bird Observatory it was also seen by Miss Janet M. McLellan, my wife and G. Stansfield.

We found the bird remarkably confiding, and were able to get excellent close-up views and take down observations on plumage and field-characters. At first we tried to ensnare it in one or other of the nets, but it was too intent on making good vantage-points of the bamboo supports and their guys to give much hope of capture by this means. After half-an-hour or so it left the root-crops, to which it had descended from time to time for insects, and flew with deep undulations to the neighbourhood of the Haa, where there is a Heligoland trap. Eventually we were fortunate enough to catch it there—assisted by a small flock of Starlings (*Sturnus vulgaris*) which "mobbed" the bird as it passed in front of the entrance.

It had a superficial resemblance in size, carriage and manner of flight to a Great Grey Shrike (*L. e. excubitor*), but was a much

paler and cleaner grey, and far less wild than any Great Grey Shrike I have encountered. The under-parts were suffused with pinkish-buff, but the pale grey of the flank-feathers tended to smother the contrast between upper- and under-parts. The wing was beautifully variegated and a detailed description is given later, but it is perhaps worth noting here that the amount of white visible was greater than in *excubitor* and more reminiscent of the condition found in Lesser Grey Shrikes (*L. minor*) in 1955 (*antea*, vol. xlix, pp. 94-96). A white shoulder-patch was present as in *excubitor* (there is none in the Lesser Grey), but the head was very different: firstly, the broad black band behind the eye ended squarely, and was not gently rounded posteriorly as in the Great Grey; secondly, the lores were dusky, not black; and thirdly, the base of the bill was noticeably pale, appearing pale brown at a short distance, whereas the bill of the other is wholly black. The bird was provisionally identified as *pallidirostris* on this character coupled with the very pale coloration, and the identification was later confirmed in the laboratory with the aid of Dresser (1895, 1902), Hartert (1910) and Meinertzhagen (1954).

The shrike may well have been newly-arrived as 21st September was a fine day of moderate south-easterly wind, ahead of a weak cold front stretching from north to south of the British Isles. The weather-maps for midnight and 0600 hours (*Daily Weather Report of the Meteorological Office*, no. 34,637) show mist at several stations along the North Sea coasts of England, Holland, Denmark and southern Norway, and in many inland localities in western and middle Europe, the Continent being under the influence of a vast anticyclone which had been moving slowly eastwards since the 18th. During this period there had been a generally easterly airflow south of the high pressure centre from the Transcaspian region across middle and southern Europe and the northern shores of the Mediterranean basin.

#### DESCRIPTION

The whole of the upper-parts were pale french-grey, the rump having a slight yellowish tinge; the scapulars were slightly paler with their whitish tips forming a shoulder-band, suffused with yellowish. The chief feature of the head was the broad black band on the ear-coverts, square-cut posteriorly; some of these feathers had slight brownish fringes, the lores were dusky, and there was a narrow white eyestripe. The malar region, chin and throat were whitish, the breast and upper belly pinkish-buff, and the lower portions off-white with a greyish suffusion on the flanks.

*Wing.* Primaries blackish-brown, their basal halves white, and the three innermost tipped with white. Primary-coverts blackish-brown, the innermost with white tips. Secondaries blackish-brown with broad white tips and outer edges. Alula dark brown, the feathers fringed whitish. Greater coverts dark brown mottled

buffish towards the tips and fringed with white. Median coverts jet black, forming a bar across the mid-wing: these feathers appeared to be new in comparison with the other coverts, which were more abraded. Lesser coverts french-grey with dark tips obscured by yellowish fringes. Under wing-coverts and axillaries white.

*Tail.* The two outer pairs of feathers were white, the next pair black with white outer webs, white at the base and with broad white tips; the fourth pair was similar but with the white basal patch and tips reduced; the fifth pair was blackish-brown, and the middle pair dark brown.

*Bill.* The bill was horn-colour, the ridge of the culmen black, and both mandibles darkened perceptibly towards the tip, the underside of the lower mandible becoming black. There was a strong flesh-coloured tinge at the base of the bill, very pronounced in the field.

The tarsi were blackish-brown, the claws black.

*Wing-formula.* 3rd primary longest, 2nd 6 mm. shorter, 1st 41 mm. shorter, or 18 mm. longer than the primary-coverts. The feathers inwards of the 3rd were shorter than it by: 4th-3 mm.; 5th-7½ mm.; 6th-15 mm.; 7th-21 mm.; 8th-25 mm.; and 9th-29 mm. The outer webs of 3rd, 4th and 5th were emarginate. In comparison with the Great Grey Shrike it should be noted that the 3rd (not 3rd and 4th) provides the wing-point, and the 2nd is slightly longer than the 5th (not slightly shorter than the 6th): the emargination and position of 1st primary are the same. In the Lesser Grey Shrike the 3rd provides the wing-point, but the 2nd is only slightly shorter, the 1st does not extend beyond the primary-coverts, and only the 3rd and 4th are emarginate.

*Measurements.* Chord of wing, 112 mm.; bill from skull 19 mm. and 9½ mm. at its greatest depth; tarsus 33 mm. (apparently longer than in the Great Grey) and 3½ mm. thickness at the foot; tail, 105 mm. The bill-depth and tarsus thickness were taken with a Blake leg-gauge.

The bird weighed 60.65 gm. We have four weight-records for the typical race, viz. 48 gm., 64.17 gm., 58.07 gm. and 57.56 gm. and Weigold (1926) gives, for 4 examples of *excubitor*, 52-66 gm., average 60.3 gm.

*Field-characters.* The best field-characters are provided by the very pale grey appearance, without any strong contrast between upper- and under-parts; the abruptly squared termination of the broad black band behind the eye; and the noticeably pale base of the bill, which appears to be pale brown rather than flesh-colour at a short distance.

#### DISTRIBUTION

There is one previous record of this handsome shrike in western Europe, a male collected on the island of Utsira in south-west



Norway on 5th September 1953 (Edberg, 1954). This specimen is in the Stavanger Museum.

The Steppe Shrike inhabits deserts covered with thorn scrub, and feeds mainly on insects but also on small birds and mammals and possibly lizards. It breeds over most of the region between the Caspian and Aral Seas and the river-courses which run westwards from the mountainous country of Kirghizia and Tadzhikistan, the Syr Dar'ya and Amu Dar'ya. Bogdanov found it nesting in the northern Ust-Urt and the Mangyshlak Peninsula, but it was not known to nest on the European shore of the Caspian opposite until 1928, when Vorobiev found it fairly commonly in the steppe country along the east bank of the Volga to about 90 miles north-east of Astrakhan (*Ibis*, vol. 76, p. 161). Interesting details of its distribution in the Transcaspian region are collated from the writings of Russian authors by Dresser (1895), and a summary has been given recently by Edberg (1954). Outside the breeding-season, this race is found over most of the arid countries of the Middle East and in north-east Africa (Meinertzhagen, 1954).

Among the material in the British Museum (Natural History) a male from 14,000 feet in the Pamirs (N.W. Kashmir) on 24th October 1897 is the easternmost example of typical *pallidirostris*. An immature female from South Arabia on 25th September 1899 is very similar to the Fair Isle bird, having new black median coverts and worn brown greater coverts edged with white. A male from the Sudan on 2nd January 1914 is more advanced in moult, the median and greater coverts and tertiaries being black, but the primaries and secondaries and primary coverts and alula being still unchanged. Other specimens of typical *pallidirostris* come from Abyssinia, Eritrea, Palestine (Gaza), Saudi Arabia and Persia (Luristan), but there is evidence from migrant and wintering shrikes occupying this vast region that *pallidirostris* intergrades with neighbouring races. December birds collected by H. W. Waite in the Punjab have very pale bills and generally pale plumage, but a head-stripe with the black prominent between the bill and eye, and they appear to be intergrades between *pallidirostris* and *lahtora*. Others with similar characteristics from localities on the River Tigris and in the Sudan suggest intermediacy between *pallidirostris* and *aucheri*, which itself intergrades with the more westerly *elegans*.

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# PHOTOGRAPHIC STUDIES OF SOME LESS FAMILIAR BIRDS

## LXXXII. GREAT GREY SHRIKE

Photographed by ERIC HOSKING and F. GÖTTSCHE

(Plates 37-40)

Text by I. J. FERGUSON-LEES

THE TYPICAL SHRIKES (*Lanius* spp.) are a widespread genus that is represented in Europe, Asia, Africa and N. America by some 22 species—that is treating the Brown, Isabelline and Red-backed Shrikes (*L. cristatus-isabellinus-collurio*) as conspecific. Of these species, eight are confined to Africa and one to N. America, and seven are found almost exclusively in Asia, particularly the south and east; the remaining five species are spread over more than one continent. It is the five species of the last category that are the only ones found in Europe; four of these shrikes are particularly widespread and one—the Masked Shrike (*L. nubicus*)—is restricted to S.E. Europe, Asia Minor and Persia. The subject of our photographs this month is the Great Grey Shrike (*L. excubitor*), which is the most widespread of them all, even though it is only a scarce but regular winter-visitor to Britain, chiefly to eastern districts.

This bird is represented by about 18 races over the four continents where shrikes are found. It breeds from Spain, France, Holland and Scandinavia (north to 70° in Norway) right across the U.S.S.R. to Anadyr and the Bering Sea in the north-eastern corner of Siberia; to the south it nests in the northern half of Africa, in Arabia, Persia, India and western China; and in N. America from Alaska across Canada to Labrador. Thus its breeding-range extends from well within the Arctic Circle almost to the Equator, and at about latitude 60° N. it goes right round the world: a remarkable range for what at first sight might seem to be a rather specialized species. The typical Great Grey Shrike is a strikingly contrasted, three-colour bird, grey above and white below with black eye-patch, wings and tail (plate 37). Across the range of the species, however, there are considerable differences in the colour of the upper-parts from dark grey to very pale blue-grey, and in the under-parts from white to grey or varying degrees of pink; there are also variations in the bill-colour and shape of eye-patch, and an interesting cline in the amount of white at the bases of the primaries and secondaries, which results in a double wing-bar in the northern group and a single one in southern forms (in this connection plate 41 left should be compared with 39 lower). The desert races are, as one would expect, rather different from the Arctic forms and a description of the first such individual to be recorded in this country, an individual of *L. e. pallidirostris* which

extends from Transcaspia to Kirghizia and into western China as far as the Hwang Ho, appears in the account by Kenneth Williamson elsewhere in this issue (see pp. 246-249; also plate 41 left, which should be compared with plate 37 and others).

Except for Mr. Hosking's fine flight shot of a winter bird in England, the photographs in our main series were taken in Spain and Switzerland, the latter photographs (those taken by Mr. Göttschi) coming to us through the kindness of Dr. E. Gattiker, Editor of the Swiss journal *Die Vögel der Heimat*. Though the Great Grey Shrikes of Spain belong to the South European *L. e. meridionalis* which is normally darker above and more pink-tinged below than those of the typical form inhabiting most of the rest of Europe, the differences are not such that they affect these plates, except that, with no white on the secondaries, there is only a single wing-bar. In Europe the Great Grey is likely to be confused only with the Lesser Grey (*L. minor*) and these plates clearly bring out many of the distinguishing features: the grey (not black) forehead, the narrow white line above the black eye-patch, the larger area of white on the scapulars (plates 37 and 40) and the long tail. The Great Grey Shrike's somewhat larger size is often of less value in the field than the normally very different stances of the two species, which are not emphasized enough in many drawings: in order to balance its much longer tail the Great Grey leans forward with what is at times a quite thrush-like posture, while the Lesser Grey has a strikingly upright, almost flycatcher-like, stance (the larger bird does not usually hold itself more upright than it appears in plate 37). Plate 39 (lower) gives a particularly good impression of the flight-pattern: the grey and white body contrasted with the black mask, the white-edged black tail and the black wings, the last divided down the centre by the white line formed by the white bases to the primaries and outer secondaries (in the Lesser Grey this line is broader and shorter, there being no white on the secondaries, but again compare plate 41 left and see p. 247).

The Great Grey Shrike is a bird both of open country and wood-edges, but it is more fond than most of the shrikes of orchards, gardens and thick hedgerows. On the Coto Doñana in southern Spain, where Mr. Hosking's excellent nest-photographs (plates 37 and 40) were taken, this species was variously found on the edges of pinewoods, with or without an association of thorn-bushes; inside the more open parts of the pine-woods; in small concentrations of cork and/or ilex oaks, or where these trees were more scattered; and in a kitchen-garden bounded at one end by an enormous mass of brambles, thorn and prickly pear. The nest at which these photographs were taken was 7 feet from the ground in an ilex oak, somewhat insecurely attached at the ends of two of the rather thin lower side-branches, and the site was quite dark as a result of the surrounding canopy. By contrast, another nest was only 4 feet from the ground in the centre of a



small clump of brambles, in the shade of a large cork oak. Nest-sites, in fact, vary from almost ground-level in bushes, to a height of perhaps 40 feet in pines or deciduous trees; and they may be in a main fork (a favourite site with fruit trees) or at the end of a small branch. The Great Grey Shrike is thus more catholic in its choice of nest-site than is the Lesser Grey, which seems to be much more strictly a tree-nester.

The nest is about the size of that of a Song Thrush (*Turdus philomelos*), rather bulky, made of twigs, lined with rootlets, grasses and a varying quantity of feathers: often there are only a few feathers, but some nests are profusely lined with them, as was one of those found on the Coto Doñana. It is a deep structure: the one at which Mr. Hosking's photographs were taken (plates 37 and 40) had a cup 7.5 mm. deep and 12 mm. across. This nest when found on 3rd May 1956 contained 6 eggs (5-6 is the normal clutch in Europe, except in Scandinavia where c/7 becomes more common). These hatched on or about the 13th, giving a first-egg date of about 23rd April, allowing 15 days for incubation. These pictures were taken on 17th May when the young were about 4 days old, and it was interesting to note that there was no bird-prey among the food brought to the nest during the 43 visits paid by both parents in just three hours. Nor had there been any on either of the two previous days when Guy Mountfort and Roger Tory Peterson were in the hide. Lizards (in pieces or whole, small or up to six inches long), cockchafers and other beetles, and mole-crickets (*Gryllotalpa*) were the commonest prey, but at least two shrews were stuffed down the young whole (16th May, when 3 days old), and spiders, Diptera, small dragonflies and moths were also included (*cf. The Handbook*, vol. I, p. 282). Particularly in the more northerly parts of the bird's range, many more small birds are taken; yet some of the desert races are almost exclusively insectivorous.

We found no traces of a "larder" in the territories of the pairs watched on the Coto Doñana, and this habit, as with the Red-backed Shrike and the Woodchat (*L. senator*), is evidently inconstant. A Great Grey Shrike's larder is however, shown on plate 39 (lower). Detailed contributions on the subject of the larder of this species have been written in recent years by S. R. Rasmussen (1955, *Flora og Fauna*, vol. 61 (2), pp. 40-52), S. Haftorn (1953, *K. Norske Vidensk. Selsk. Årbok* 1952, pp. 99-106) and H. H. Reinsch (1955, *Orn. Mitt.*, vol. 7, p. 75). The last of these describes a most interesting case on Heligoland in October 1954, where a decapitated Song Thrush was found on top of a block of cement, the remains of a scattered army block-house. This bird was spitted on a round, hard piece of metal, "as thick as a thumb", whose point stuck out of the concrete-block. The iron was pressed between the spinal column and the breast-bone. Photographs were published of the shrike returning to its prey.

Since no details are given in *The Handbook* of the nestling Great

Grey Shrike, it might be added that when first hatched six nestlings had yellowish-horn bills with brownish tips, yellow to whitish flanges, inside edges of mouth yellow, centre to roof greenish, tongue pink. Three days later the centre to the roof was rose-pink and the tongue bright yellow. In a just-fledged juvenile trapped on 12th May (this would be 19-20 days old, on the fledging-period given in *The Handbook*) the whole gape was purplish-pink with yellow round the edges and yellow flanges; the legs were lead grey.

While actually nesting, the Great Grey Shrike, like the smaller shrikes, becomes rather inconspicuous and, to give an example, one pair on the Coto Doñana had a nest within 600 yards of where we were staying, yet for a fortnight we had no inkling of the presence of the birds. In winter, as we see it in Britain, it perches conspicuously on bush-tops or telegraph-wires, from which it swoops down on its prey and which it uses to defend a winter-territory. The boundaries of these winter-territories are evidently sometimes regularly adhered to, winter after winter (see pp. 271-272).

## SEWAGE-FARMS AS BIRD-HABITATS

By A. W. BOYD

### INTRODUCTION

FROM THE POINT of view of the birds that visit our sewage-farms, attracted there by food of unusual abundance and sapidity, and of the watchers who in turn are attracted by the birds, the modernization of one after another of these artificial marshes is little short of a calamity, necessary though it may be for the community as a whole. It is because future ornithologists, not fortunate enough to have known these farms in their glory during the last 50 years, may fail to understand their nature and condition, and their fascination for bird and man, that these notes are written. It is true that some of the still-growing body of bird-watchers have tended to become too sewage-farm-minded and to forget the birds of hedgerow and meadow, but there can be no doubt of the value of the observations and records obtained.

As late as 1921 the then Editors of *British Birds* wrote: "Our knowledge of the migration of waders across country is still very scanty"; and they asked for details of occurrences. Since that date these records have revolutionized our ideas of cross-country wader-migration; from them we have learnt much about the status and distribution of birds of which 50 years ago little was known, about the regular passage of waders once thought to be rarities, and even about an almost regular passage across the Atlantic.

## HISTORY

The sewage-farms, some of which had been started in a small way during the second half of the 19th Century, had to be greatly enlarged from about 1900, as new methods of water-sanitation were introduced and urban populations increased; filter-beds were established and thus areas of alternating water and mud were formed, that proved particularly attractive to many birds—a system now rapidly becoming out of date. But it took a long time for ornithologists to realize that in a sewage-farm they had an accessible observation-post and an attractive habitat for birds often almost at their doors, and thus our knowledge of them in their earlier days is meagre. Let us consider five of the farms that have attracted most attention.

- (1) CAMBRIDGE.—Part of the land was bought in 1893 and its active use as a sewage-farm began in 1895. In 1896 it was enlarged to its present size and in that year Curlew Sandpiper\* and Red-necked Phalarope were recorded there. Yet until 1912 or 1915 there were apparently no observations made after that, or at least none recorded, nor until 1927 and 1929 was the farm watched regularly.
- (2) READING (Berkshire).—This sewage-farm was established in 1875. Wallis and Wood (1933) wrote that, so far as was known, conditions from 1875 until 1914 were similar to those obtaining during 1922-32. After intensive farming during the First World War, it had by 1922 returned to pre-war conditions, but it was not discovered by any ornithologist until then, when Dr. Norman H. Joy began regular observation.†
- (3) ALTRINCHAM (Cheshire).—So far as can be ascertained, the recent methods of sewage-disposal began between 1900 and 1905. In 1916 C. M. Gadd first found it was attractive to birds, and in 1921, after his return from war service, saw Ruffs and other waders there, and informed T. A. Coward. Coward lived in Bowdon, within 4 miles of the farm, but had never visited it and, indeed, probably did not know of its existence. After that, however, until his death in 1933, he went there regularly.
- (4) NOTTINGHAM.—From small beginnings this sewage-farm has been gradually extended; pools of water had begun to form in the years before 1914 and these attracted duck, snipe, etc., so that it became a popular shoot. Whitaker (1907) referred to it and recorded several rare

\*Scientific names of species mentioned in the text are all given in an appendix on p. 263.

†A paper with special reference to Reading sewage-farm was given by W. B. Alexander as part of a symposium on the biology of sewers at the meeting of the British Association in Oxford in 1955 (see Spaul *et al.*, 1955-56).



species taken in the area, but it was not "re-discovered" until 1934, by Jack Staton, since when it proved to be probably the most important farm in the country as a place of observation.

- (5) LONDON.—The London farms, many of them old-established, were visited soon after 1900 by G. E. Lodge and there are a few records made between 1906 and 1912, but here again it was not until 1923-29 that Dr. G. Carmichael Low discovered migrating waders at Langley. Two years later more regular watching on the main farms began, but it was later still, in the 1940's, before the most prolific, Perry Oaks, was included.

Examination of the 50 volumes of *British Birds* has been made, a long-protracted job, so often was one diverted from the original object of the search by irrelevant but equally interesting papers and notes. The first mention of waders on a sewage-farm was found in vol. ii:—"The third recorded specimen of Little Stint for Derbyshire was shot out of a trip of a dozen on the sewage-farm at Egginton, September 26th, 1908". The next was in 1912 when I wrote a note in vol. vi on the birds of Clifton Junction sewage-farm, in the Irwell valley of Lancashire, just 5 miles north of the centre of Manchester and 30 miles from the coast, although nearer to the tidal waters of the Mersey. T. Baddeley had noticed Ringed Plover there and told me of its existence. At this farm we found Turnstone, Ruff, Knot, Curlew Sandpipers to the number of 19, Bar-tailed Godwit and other species—an inland movement of which we had had no previous suggestion. The First World War halted observation and although it continued for a few years this farm has long been "reformed". Then in 1921 and 1922 regular observation began at Altrincham and Reading, and continued at these and other farms so long as they remained attractive.

The sewage-farms from which data have been amassed are dispersed over England and the following are the main ones, county by county from north to south:

<i>County</i>	<i>Locality</i>
Cumberland	Penrith
Durham	Darlington
Lancashire	Freckleton, Clifton Junction, Heywood, Worsley, Liverpool
Cheshire	Altrincham
Derbyshire	Egginton
Nottinghamshire	Nottingham
Staffordshire	Wolverhampton, Walsall, West Bromwich
Warwickshire	Curdworth
Northamptonshire	Ecton (Northampton)
Lincolnshire/Norfolk	Wisbech
Bedfordshire	Bedford, Dunstable

Cambridgeshire	Cambridge, Peterborough
Essex	Chelmsford, Bishop's Stortford
Berkshire	Abingdon, Reading, Ham Fields
Oxfordshire	Sandford
Buckinghamshire	Slough, Langley
Middlesex	Perry Oaks
Surrey	Beddington, Brooklands, Guildford

Also a number of other farms in the London area.

If these are plotted on a map, it will be seen that they are scattered fairly widely from Merseyside through Staffordshire, Northamptonshire and Bedfordshire in central England and that, although the Nottingham farm is strategically well-placed to attract movement passing up the Trent Valley and the London farms are within reach of the Thames estuary, those in the very middle of England, without such advantages, are nevertheless visited by many species once thought of as birds of the coast only. The existence of a cross-country movement, the possibility of which had been suggested years ago, now seems to have been confirmed. The great virtue of the sewage-farms is the way that birds concentrate there and often allow an observer a more intimate chance of watching them than is possible on the coast. On the farms, too, in the course of a day, one can watch continual movement during the height of migration, as birds of the same species not infrequently replace others that have passed on.

#### THE SPECIES INVOLVED

Taking first the waders, the family most addicted to these farms, it will be of interest to note which of the more abundant species are most prone to pass inland and which are seldom seen. Of the latter, the Oystercatcher, which is found on the coast in flocks numbered by the thousand, visits the farms only casually and indeed as a true passage-bird is almost unknown inland; this although it continues to spread as a breeding species across mid-Scotland and northern England. The Knot, occurring on the coast in flocks consisting of tens of thousands, is another abundant wader that rarely comes inland; and a third is the Sanderling, a few of which certainly come to the farms in May, but which otherwise tends to keep strictly to the coast. Another species in the same category is the Purple Sandpiper, of which I can find only two records (in Staffordshire and Nottinghamshire), although the Turnstone, its companion on the rocks, comes inland with some regularity in spring and autumn (but always in small numbers). In contrast, Ringed Plovers regularly visit the farms in spring and summer, occasionally in flocks of over a hundred. The Dunlin, too, comes every year to the filter-beds, mainly in spring and autumn, and like the Ringed Plover sometimes tops the hundred.

These and the Little Stint, which arrives in small numbers in most years, the Bar-tailed Godwit and the Grey Plover, only occasional visitors to central England, comprise what may be considered essentially sea-coast birds; and of them only the Ringed Plover and Dunlin appear regularly in such numbers as would indicate a cross-country migration-route.

There are other waders, some of which, previously recorded mainly from the coast, have now been shown to come to the sewage-farms quite regularly and often in larger numbers than apparently came to Britain in the past. Whether it is that formerly these numbers were present but unseen, or that the birds have gradually learnt to visit the farms each year, or that they have made a general increase in numbers, it is impossible to say, except possibly in the case of the Black-tailed Godwit, which has increased remarkably in recent years in the estuaries and on the coast, and in consequence has been seen more often on sewage-farms.

Green and Wood Sandpipers are regular patrons of the farms, where they may be seen more regularly and in greater numbers than elsewhere, sometimes a score at a time. The Wood Sandpiper, in particular, is infinitely better known than in the past, and in the autumn of 1952 appeared on at least seven sewage farms in different parts of the country. Temminck's Stints have also been attracted to the filter-beds in several parts and have been seen more often in recent years. The ubiquitous Redshank is seen on all of the farms, and at some of them it nests regularly; this species shows two or three peaks of abundance, sometimes in mid-March, often in August/September, and at some localities again in November/December when numbers may reach 150; from a number of far inland farms, however, it disappears completely between autumn and spring. The Spotted Redshank, once considered a quite rare bird, turns up regularly at some of these places, recently in every month of the year, and the Greenshank quite commonly in spring and autumn. The Curlew Sandpiper is the species of its family that seems most to enjoy the sewage-beds, and is to be seen there just as often and in larger parties than on the coast. Sometimes in spring and every autumn it appears in flocks numbering between 15 and 50, and at Nottingham and Altrincham has exceeded the hundred.

The wader whose status has been altered more than that of any other, however, or at least made more evident by its recourse to the farms, is the Ruff. Fifty years ago to see one was quite an event. Now flocks of 10 to 20 or 30 create no surprise in almost any month of the year; sometimes flocks are still larger, and in recent years its growing tendency to winter on or near sewage-farms has quite altered our knowledge of its status.

We have also learnt much about less common species, for it is on these man-made marshes that strangers tend to settle and there the bird watcher has often been waiting to welcome them. The Black-winged Stilt, two pairs of which actually bred at Nottingham



in 1945, was seen in that year on four other sewage-farms in Lancashire, Cambridge and London. Avocets, now that they breed again in East Anglia, occasionally visit the farms, mostly in the east midlands; the latest case is of five in Derbyshire. Both Red-necked and Grey Phalaropes, an occasional Great Snipe, and from time to time Kentish and Little Ringed Plover, pay casual calls; the Little Ringed Plover, in fact, is a regular visitor to some farms and on at least one (Ham Fields, Berks) it has nested. A Marsh Sandpiper in Cheshire and Broad-billed Sandpipers in Lancashire and Berkshire have both been identified on the filter-beds. Of special interest, too, has been the arrival of American waders. From sewage-farms alone come records of Greater Yellowlegs at Northampton, Lesser Yellowlegs at Cambridge, Altrincham and several farms in the vicinity of London, Baird's Sandpiper at Perry Oaks, White-rumped Sandpiper at Freckleton and Wisbech, Buff-breasted Sandpiper at farms at Northampton, Peterborough and near London, and Pectoral Sandpiper at a number of farms.

So much for the waders, the group about which most has been learnt, but apparently any bird of any family may turn up at any time. Gulls of almost all species and in large numbers habitually visit the farms from which they go at dusk to roost on the large meres and reservoirs. Surface-feeding duck, often in hundreds, feed on the beds at night and depart for their day-time resting-places soon after dawn; for them the farms are an important source of food. Except at Nottingham, where Common Terns and Lesser Black-backed Gulls as well as the stilts have nested, few farms are big enough for many birds to breed without disturbance, although duck of several species, Redshank, Snipe, Yellow and Pied Wagtails, etc., often rear their broods, and there are or have been colonies of Black-headed Gulls at a few of these places. But a list of casual visitors would read almost like a British Birds' Catalogue: such as a Squacco Heron at Nottingham, a Glossy Ibis at Wolverhampton, some of the rarer duck, Sabine's Gull, Black, White-winged Black, Gull-billed and Roseate Terns all at Nottingham. It is in fact at various sewage-farms that many of the Black Terns and Little Gulls that are recorded in Britain are seen.

Insect-eating and seed-eating birds also find these farms most attractive. Hirundines in great numbers, wagtails and pipits, finches and sparrows, to mention a few. It is on sewage-farms that I have seen the largest flocks of Yellow Wagtails, and at one time a vast cloud of Greenfinches that rose in thousands from a bed of persicaria.

Coward (1927) pointed out the abundance of larvae of gnats (Chironomidae) and moth-flies (Psychodidae) on which birds that visit the farms feed. Dr. R. J. Raines, who has had great experience of Nottingham, has compiled the following ecological survey of

this great farm, in relation specially to the birds, and has most kindly allowed me to include it in this paper.

### **Nottingham Sewage Farm**

By R. J. RAINES

The farm is situated just to the east of Nottingham and lies alongside the river in the Trent Valley. It extends for about five miles between the villages of Netherfield and Gunthorpe and its maximum width is about one and a half miles. Approximately half of the total property is always typical farm-land devoted to crops and pasture, but the remainder consists of various types of sewage filter-beds. These filter-beds are separated into distinct areas, but there is frequent interchange in the usage of land, one area only being permanent—that devoted to the disposal of heavy sludge. In close association with the farm and around its boundaries are important features which affect the ornithology, such as two gravel-pits, the river, several willow-holts and small, mixed plantations.

The broad principle of sewage-disposal is of importance in the ecology of the filter-areas and must therefore be outlined. After being treated to effect the destruction of possible pathogenic bacteria, the sewage is separated into sludge and supernatant fluid. Concerned in this process are large, open, brick and concrete tanks about fourteen feet in depth, which when filled contain sewage-water and much floating debris. The sludge portion of the separation is pumped through metal pipes on to prepared tanks; these consist of areas of roughly ploughed land around which a bank of earth, two or three feet high and about three feet in width, has been constructed. Here the sludge slowly dries out and becomes caked; it is eventually dug out and may be disposed of as fertilized soil. The watery fraction of the separation process is transported by means of wide concrete or earthen ducts to the filter-tanks, which are very similar to the sludge-tanks, but usually shallower and of greatly varying size. This water is allowed to evaporate and filter through the soil, the filtration being assisted by the rapid formation over the soil of an algal growth which is encouraged. There is eventual overloading of these areas and it becomes necessary to drain and rest them. During this period the particular area may be left dry, ploughed, reset and reflooded, or sown with seed for crops of various kinds.

It will be seen that the processes outlined give rise to several very specialized and always variable habitat types, influencing the birds attracted to the farms and their distribution thereon.

The bricked tanks concerned in the initial separation are barren of vegetation and contain no macroscopic life. These tanks exist only in two states in respect of their effect on birds: when flooded there is often much floating debris which attracts many gulls and other scavenging species; in the recently drained state there is

much residual mud, this sometimes making a foraging-ground for wagtails, Starlings, etc.

The sludge-tanks are much more favourable for birds and require more detailed consideration. Although it should be realized that all stages are co-existent, it is convenient to describe the development of a newly-formed area. Initially the tanks are free of vegetation and the mud is too fluid to allow any birds to alight, but during the spring and summer they form the breeding-ground for myriad insects, principally Diptera. The mud dries slowly, first allowing the smaller insectivorous birds to alight; later larger species together with gulls, Lapwings and Ruffs, the latter species particularly associated with pools of soft mud. When completely dry the mud is extremely hard and often cracks in jig-saw fashion. If areas such as this are reflooded by rain the tanks may be favoured by certain species of migrant wader, one of the more interesting of these being the Turnstone, which is able to turn over the smaller cakes of mud.

On the dry and semi-dry tanks there is prolific growth of vegetation in spring and summer; predominant amongst this are tomato, persicaria, mugwort, bur-marigold and nettles. Clumps of decorative and edible cultivated plants, such as the tomatoes, owe their origin to seed in the sewage. Sunflowers, which often grow commonly, are perhaps the only species of such plants which have any particular attraction as a food supply for birds. The vegetation is exceptional in two respects: firstly the fertility of the soil is such that the actual sizes of many plants are exaggerated; secondly the free growth of "weeds" of this type, unhindered by co-incident growth of grasses and other species of universal distribution, is rare elsewhere during the present day of "complete" cultivation. The importance from the ornithological aspect lies in the provision of dense cover both for breeding birds in the spring and for small migrants in the autumn. Further, the insect life which it supports and the seed produced give rise to an abundant food-supply for many species of small birds. When the tanks become completely dry those parts of the mud which have not supported vegetation become so hard that fresh seed is unable to gain hold; such patches become very arid and are little frequented by birds.

The newly-formed sludge tanks in winter run a very different course. The absence of flies and larvae means that the major source of food for birds is lacking and the mud often becomes hard before plant seed has penetrated. These areas are again of little use for foraging birds, but they often form the main roosting-site for large winter populations of gulls, Lapwing, Golden Plover and Curlew.

The filtering-tanks occupy by far the largest specialized part of the farm and are undoubtedly the main attraction to the birds. These pools vary in size from large lagoons, some of which may be up to 300 yards long, to small areas 20 yards square. The



enclosing banks are merely earthen walls about two feet high and just wide enough to walk on; thus the water is at its maximum only about eighteen inches in depth. The tanks supplied by each conductor are interconnecting by means of breaks in the retaining banks. On some areas the water is poured constantly at a rate equal to the filtration-rate; on others the tanks are merely filled and allowed to dry. There are thus always areas flooded with semi-permanent water and others containing freshly-exposed mud. There is a tide in that the rate of pumping varies between day and night.

Many subtle variations in the character of the lagoons prevail under this system and these appear to be important in the distribution of the birds. Factors such as the depth of the water, the amount of mud exposed and the length of time which the water is left standing are basic, but superimposed are such variables as the amount and type of vegetation and of the pond-life in the water. Thus, for example, a tank which has been flooded for a short time only and is then drained will leave soil little altered, whereas one which has been under long-term flooding and has had many cycles of plant- and animal-growth will leave a black ooze with high content of rotting vegetable matter and debris. The wading birds are those most influenced by distribution and composition of mud, some species being virtually confined to certain conditions, others being more generally distributed, but showing marked preference for mud of a certain type. Temminck's Stints were found almost exclusively on the shallow, soft ooze of fine, rotted vegetable matter produced by the draining of tanks which had been long under water. Many of the smaller waders such as Redshank, Dunlin and Ringed Plover, frequent any of the draining-pools as soon as mud becomes exposed, but nevertheless show preference for tanks, incompletely drained, where residual pools remain over a long period.

The plant-life of the filter-areas is extremely prolific but much more confined than that of the sludge. The banks are semi-permanent and may not be disturbed for several years apart from scything when growth becomes too rank. Most numerous plants are grasses, docks, nettles, persicaria and bur-marigold. The pools themselves support only persicaria, docks and aquatic grasses, the first growing in great profusion and often entirely occupying large areas. The importance of the bank-vegetation lies almost entirely in the cover which it supplies for nesting and skulking birds. It is little used for feeding purposes. Aquatic plants are, however, much more utilized for food. The persicaria provide large quantities of seed in addition to affording perches to allow small insectivorous birds to prey on abundant insect life over the water. In winter the aquatic grasses are extensively grazed by swans and ducks. Frequently, tanks overgrown with vegetation are flooded and the plants drowned; these conditions

are particularly favoured by the longer-legged wading birds such as Greenshank and Spotted Redshank which feed on drowned larvae.

The filter-beds are most rich and outstanding in their content of macroscopic animal and vegetable life. The flood-pools harbour enormous numbers of mosquito larvae; larvae of Diptera, particularly "rat-tailed maggots"; chironomid larvae; algae, daphne, etc. Many of these creatures exist almost exclusively in the pool in which they occur. The soil and mud of the tanks harbours a species of earthworm in such abundance that a few persons are able to make a business of collecting them for sale as angling bait. This great wealth of small life provides an apparently inexhaustible supply of food for a great variety of birds and is the greatest factor in the attraction of birds to the sewage-farms.

The farm is of considerable age and was known to Whitaker (1907), but it is unlikely to have been so extensive in that day, and would probably have been dwarfed by natural marshes of the Trent valley. Although the area must have attracted a wealth of birds for many years its peak was certainly reached during the years of the Second World War (1939-45). At this time the effect of shortage of labour benefited the birds and there was less disturbance by patrolling workers; filter-beds were used for longer periods, allowing greater maturation of food-chains; a larger area of land was under flood and little attempt could be made to keep the prolific vegetation in check; most important of all—no shooting.

Such then are the conditions of the sewage-farms which before long will be only a memory, as modern methods of sewage-disposal take the place of that which for 50 years has served the birds so well.

#### ACKNOWLEDGEMENTS

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APPENDIX—LIST OF SPECIES MENTIONED IN THE TEXT

Squacco Heron ( <i>Ardeola ralloides</i> )	Pectoral Sandpiper ( <i>Tringa melanotos</i> )
Glossy Ibis ( <i>Plegadis falcinellus</i> )	Dunlin ( <i>Calidris alpina</i> )
Oystercatcher ( <i>Haematopus ostralegus</i> )	Curlew Sandpiper ( <i>Calidris testacea</i> )
Lapwing ( <i>Vanellus vanellus</i> )	Sanderling ( <i>Crocethia alba</i> )
Ringed Plover ( <i>Charadrius hiaticula</i> )	Buff-breasted Sandpiper ( <i>Tryngites subruficollis</i> )
Little Ringed Plover ( <i>Charadrius dubius</i> )	Broad-billed Sandpiper ( <i>Limicola falcinellus</i> )
Kentish Plover ( <i>Charadrius alexandrinus</i> )	Ruff ( <i>Philomachus pugnax</i> )
Grey Plover ( <i>Charadrius squatarola</i> )	Avocet ( <i>Recurvirostra avosetta</i> )
Golden Plover ( <i>Charadrius apricarius</i> )	Black-winged Stilt ( <i>Himantopus himantopus</i> )
Turnstone ( <i>Arenaria interpres</i> )	Grey Phalarope ( <i>Phalaropus fulicarius</i> )
Snipe ( <i>Capella gallinago</i> )	Red-necked Phalarope ( <i>Phalaropus lobatus</i> )
Great Snipe ( <i>Capella media</i> )	Lesser Black-backed Gull ( <i>Larus fuscus</i> )
Curlew ( <i>Numenius arquata</i> )	Black-headed Gull ( <i>Larus ridibundus</i> )
Black-tailed Godwit ( <i>Limosa limosa</i> )	Sabine's Gull ( <i>Xema sabini</i> )
Bar-tailed Godwit ( <i>Limosa lapponica</i> )	Black Tern ( <i>Chlidonias niger</i> )
Green Sandpiper ( <i>Tringa ochropus</i> )	White-winged Black Tern ( <i>Chlidonias leucopterus</i> )
Wood Sandpiper ( <i>Tringa glareola</i> )	Gull-billed Tern ( <i>Gelochelidon nilotica</i> )
Redshank ( <i>Tringa totanus</i> )	Common Tern ( <i>Sterna hirundo</i> )
Spotted Redshank ( <i>Tringa erythropus</i> )	Roseate Tern ( <i>Sterna dougallii</i> )
Greater Yellowlegs ( <i>Tringa melanoleuca</i> )	Sandwich Tern ( <i>Sterna sandvicensis</i> )
Lesser Yellowlegs ( <i>Tringa flavipes</i> )	Meadow Pipit ( <i>Anthus pratensis</i> )
Greenshank ( <i>Tringa nebularia</i> )	Pied Wagtail ( <i>Motacilla alba</i> )
Marsh Sandpiper ( <i>Tringa stagnatilis</i> )	Yellow Wagtail ( <i>Motacilla flava</i> )
Knot ( <i>Calidris canutus</i> )	Starling ( <i>Sturnus vulgaris</i> )
Purple Sandpiper ( <i>Calidris maritima</i> )	Greenfinch ( <i>Chloris chloris</i> )
Little Stint ( <i>Calidris minuta</i> )	
Temminck's Stint ( <i>Calidris temminckii</i> )	
Baird's Sandpiper ( <i>Calidris bairdii</i> )	
White-rumped Sandpiper ( <i>Tringa fuscicollis</i> )	

## NEST-HOLE EXCAVATION BY THE BEE-EATER

By GUY MOUNTFORT

(Plates 43-45)

THE FOLLOWING observations were made at nesting-colonies of Bee-eaters (*Merops apiaster*) in the Camargue, France, in May 1936 and 1954, and in the Coto Doñana, Spain, in late April and May 1952 and 1956. The French colony of about 20 pairs was in a traditional gravel-bank site on the edge of a freshwater lagoon. The Spanish one was in completely level sandy ground with sparse and stunted vegetation; this was composed of about 30 pairs. Photographs were taken from a hide at both sites and observations were also made at longer range.

The selection of nest-sites by Bee-eaters is usually a leisurely procedure. Paired and unmated birds glide back and forth over the locality for several days, perching occasionally on the ground, or on projecting vegetation, stones, or cattle-droppings.



Artificially-placed perches such as sticks or old animal skulls (see plate 43 upper) are readily adopted. These provide good opportunities for observing courtship-feeding (plate 45), copulation and the regurgitation of pellets.

The excavation of nest-holes is initiated progressively, some pairs having completed their tunnelling before the last pairs have begun. A large number of tentative scrapes or excavations are attempted before the final selections are made. Both sexes invariably take part in this work.

In the case of the Camargue colony the earth of the gravel-banks was sun-baked to a very hard consistency and it was astonishing that the slender bills of the birds could make quite rapid progress in digging; some, however, were noticeably blunted by the end of the digging-period. The banks were roughly vertical and too smooth to offer footholds. The first assays were therefore necessarily made in flight. The birds swooped at the banks here and there, striking with partly open bills, as though testing the surface. The sound of this impact was clearly audible at thirty paces. Occasionally, when an apparently suitable spot was located, a bird would set to with great determination, striking again and again at the hard gravel. After 15-18 attempts the bird retired exhausted to a perch near-by, where it sat panting while the work was continued by its mate. Sometimes several quick strikes were made from one approach flight, by a series of 10-12 inch backwards and forwards flights at the site. The ability to fly backwards for short distances was clearly demonstrated. At the conclusion of the strike, or series of strikes, the bird dived downwards to one side in order to gain flying speed for the next circuitous approach-flight. The duration of each spell of work averaged four minutes per bird. Spells of combined work varied considerably, but averaged twenty minutes per pair.

During the first half hour a conical hole was made to a depth of  $1\frac{1}{2}$  inches. Thereafter attention was devoted to enlarging the outside dimensions. About twenty minutes later the entrance had a vertical measurement of  $2\frac{1}{2}$  inches and a width of 2 inches. (The ultimate dimensions averaged  $5 \times 4$  inches.) The birds then began attempting to perch on the edge of the hole while hammering the gravel with their bills. As soon as a foothold was gained the process of digging became much more rapid; the birds supported themselves on their outspread tails, woodpecker-fashion. When the holes had progressed to a depth of 4-5 inches it was possible for the feet to be brought into play and this again resulted in a noticable increase in effective output. The Bee-eater's feet are too short and are set too far back to be of practical value in excavation on the face of the tunnel, but are admirably suited for the disposal of the spoil, which is kicked out backwards in a vigorous stream. The entrances of all Bee-eater holes have a characteristic double channel from this action. Once the birds had

tunnelled to the full length of their bodies a new action was introduced—a vigorous shaking of the plumage to rid it of dust, both in flight and on returning to the observation perch. It was noticed that while entering the holes the birds invariably held their bills partly open, which is the normal position for digging. Unlike the Spanish birds (q.v.) the Bee-eaters in the Camargue worked intermittently throughout the day, with irregularly-spaced feeding-periods of up to forty-five minutes. The ultimate lengths of the tunnels were not ascertained. The inside dimensions of the bores averaged  $3\frac{1}{2}$  inches in height, by 3 inches wide.

On the level-ground site in Spain the preliminary reconnaissance procedure was similar to that in France. For at least three days before serious digging began (29th April-1st May) the birds flew back and forth over the area, perching frequently side by side on the ground and calling excitedly. On 30th April the beginnings of a number of scrapes were found. One pair was seen to make three successive scrapes within an area of four square yards in the space of twenty minutes. On the next day (1st May) several holes had reached a depth of 1-3 inches, and by the 3rd some six holes 7-9 inches deep and one of 15 inches were found, all in fairly soft sand. Digging now proceeded seriously, though with breaks of up to  $2\frac{1}{2}$  hours. Perhaps rather surprisingly, maximum activity was observed in late morning and afternoon; by contrast, the middle of the morning and the evening were rather quiet. The 15-inch hole had apparently been trodden in by some animal at the point which the excavating had reached; a dried cow-pat was placed over the spot and the next day the birds were proceeding with this tunnel. On 5th May five new holes 4-8 inches long were found and two of the others had a depth of 18 inches. Even though digging was now being carried out very seriously, there was still much indiscriminate scratching at the "false holes" which most pairs start and at which they irregularly work in the vicinity of their nests. By 7th May four of the holes had reached 18-24 inches.

Little observation was made during the next week, but by 15th May four holes were measured at 34-38 inches and all the others examined were over 40 inches, the limit of the measuring equipment available. Digging was still in progress, however, though copulation was seen on several occasions. By 18th May the behaviour of some of the Bee-eaters suggested that a number of the nest-holes were completed and that the females were laying. Copulation was frequently seen at this time and Eric Hosking has kindly provided the following summary of typical mating behaviour watched by him on this day: "Male would alight on skull of cow (which was near one of the nest-holes) with food (consisting of yellow-bodied dragonflies, hawk-moths, large beetles, bright yellow butterflies and a variety of bees) and would call to female who was in nest-hole. If female did not appear, male would go to mouth of nest-hole and call again. On leaving hole, female would have a short fly round (presumably to shake sand from feathers)

and then alight on skull. Male would feed female several times in rapid succession (see plate 45): as many as seven times once recorded. Copulation then took place". I am grateful to Eric Hosking for these notes, and to I. J. Ferguson-Lees for putting at my disposal his data on the progress of digging at the colony.

On level-ground sites the Bee-eater makes the initial scrapes with its feet, lying on its breast and working the feet alternately extremely rapidly, as though running on the spot. The sand spurts out behind in a continuous stream, in spasms of 5-7 seconds. As soon as the hole is as deep as the short legs can make it, the bird backs out and starts digging with its partly open bill, using its feet to kick out the spoil. For the first 4 inches or so the hole is directed almost vertically downwards, thereafter levelling off. However, the constant entry and exit of the birds soon causes the entrance floor to slope to about  $45^\circ$ , while the patch of ejected sand stretches progressively back from the hole in the direction opposite to the tunnel (plate 44). As the horizontal tunnel progresses the problem of ejecting the spoil increases. After a spell of digging, the bird kicks the spoil behind it as it backs out towards the entrance. Its tail and wing-tips appear vertically above ground while the bird supports itself on its bill and wing-buts and kicks out the accumulated sand (plate 43 lower). Its mate meanwhile perches impatiently at the entrance, calling "*pruik*" or "*pruik*" at frequent intervals. The digging bird answers with muffled notes from inside the hole. As soon as the digging bird's tail appears, its mate's excitement redoubles and it moves up close to the entrance, where it stands right in the path of the stream of ejected sand, shaking its head and blinking under the onslaught. The moment its mate emerges it dives into the hole and starts digging. The relieved bird flies from the site, shaking its plumage, circles once in an arc of about 30 feet and settles back at the entrance to await its turn. The birds continue this procedure so long as digging is in progress.

The digging urge is evidently all absorbing and both sexes show evidence of great impatience to take part. For example, the birds awaiting their turn were repeatedly seen to start kicking sand before their mates had completely emerged from the hole (plate 43 lower). Similarly, in the Camargue colony, the relieved birds were sometimes seen to cling momentarily to the outside of the entrance holes and to hammer the gravel with their bills as evidence of a "frustrated" digging drive.

The behaviour of two of the pairs of Bee-eaters which nested in Sussex in 1955 has been described in detail (Barham, Conder and Ferguson-Lees, 1956). The dimensions of the nest-hole entrances and tunnel-bores were similar to those in the Camargue. The Sussex tunnels were rather short, however: only  $19\frac{1}{2}$  and 40 inches respectively. There are Continental records of depths of up to 9 feet (*The Handbook*, vol. II, p. 264). The dimensions of the



nest-chambers were not obtainable from the French or Spanish colonies, as the periods of study did not extend to the conclusion of breeding. The Sussex nests were afterwards opened for examination and were found to have chambers of about  $15 \times 9 \times 5$  inches.

## REFERENCE

BARHAM, K. E. I., CONDER, P. J., and FERGUSON-LEES, I. J. (1956): "Bee-eaters nesting in Britain, 1955". *Bird Notes*, xxviii: 34-43.

## THE DIPPER'S WINKING

By JAMES ALDER

(Plates 46-47)

I HAVE had the opportunity in the last few years to study Dippers (*Cinclus cinclus*) at very close quarters while photographing them, and in fact have tamed these birds to such a degree that they have sat on my wrist to feed their young between my fingers, and have sung on my head! Thus I have had an excellent chance to observe the blinking action of the eyelid which is referred to in *The Handbook* (Vol. II, p. 222) as "still a matter of controversy".

It seemed to me quite clear that the bird showed two movements:—

(a) A quick blinking of the whitish upper eyelid, which may or may not accompany bobbing, and is the movement seen by observers at the usual distances.

(b) A high speed flick of the nictitating membrane across the eye, perceivable normally only at close quarters. This membrane is bluish-white and semi-transparent.

Having trapped Dippers for ringing and noticed that the birds made both types of blink while in the hand, it occurred to me that it might be possible to photograph the action with electronic flash. Since the blink gave no warning I experienced some difficulty in timing at first, but found that by gently stroking the bird's forehead I could "hypnotize" it into blinking slowly, and in this way I have caught the lids almost fully closed. This technique seemed artificial, however, so I hit on the method of blowing gently on the Dipper's eye, which caused it to blink quickly and naturally. It was then a matter of blow-squeeze-the-shutter to get a photograph of the upper lid in its descent.

In plate 46 (left) the eye is fully open and the white lower lid is a prominent feature. I have frequently observed this lower lid when the bird was not blinking and in some individuals it is quite white (see plate 47 right). The upper lid seems always to be concealed among the blackish brow-feathers until the blink takes place, and it comes as quite a surprise that so much white can be hidden there.

Plate 46 (right) shows the white upper lid descending. Careful scrutiny shows that the nictitating membrane has also passed completely over the eye, obscuring the pupil and giving a lifeless look. While I have seen the eyelids closing fairly slowly, when the membrane appeared not to be moving also, it would be hard

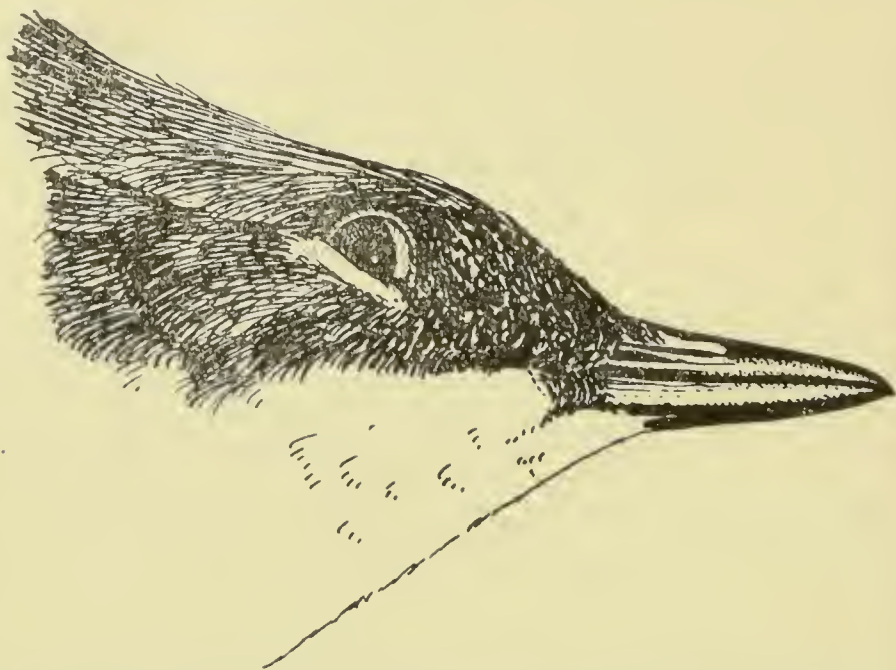


FIG. 1.—THE NICTITATING MEMBRANE OF THE DIPPER (*Cinclus cinclus*)  
Sketch to show the approximate appearance of the membrane as it leaves the inner corner of the eye.

to prove that it does not always flick across at the moment when the lids are about to close! It might well be that this does actually happen, and it is interesting to note that the membrane is also across the eye in plate 47 (left), just showing as a thin bluish line between the black edges of the lids. Certainly, however, the nictitating membrane does operate independently of movement of the upper lid, but as I could not foresee this action and it could not be induced, only luck (and many negatives) could catch it. The action of the membrane in the Dipper of N. America (*C. mexicanus*)—which lacks the white breast of our bird, but which also has a prominent whitish lower lid—is stated (*Auk*, 1927, p. 169) to be an almost vertical one from above, but in the British species the action is almost across the eye from inner to outer corner, with a slightly downward tendency (see Fig. 1), and is almost at right-angles to the action of the upper lid. The edge of the membrane appears from the inner corner of the eye at an approximate angle of  $75^\circ$  relative to the beak.

Plate 47 (left), showing the lids almost closed, gives the effect which I contend is the “blink” that most observers see at a

distance. The blackish edges to the lids form a line across the middle of the eye of approximately  $40^\circ$  relative to the beak.

After watching Dunlin (*Calidris alpina*) and other species being ringed, I am wondering whether we over-rate the "nervous" blinking of the Dipper. The Dunlin, for instance, appeared to blink as often as the Dipper, but the lid, not being white-coloured, did not impress itself.

## NOTES

**The Penguin-dance of the Great Crested Grebe.**—The Editors have asked me to comment briefly on the remarkable photograph of the Penguin-dance of the Great Crested Grebe (*Podiceps cristatus*) published in this issue (plate 48). Comparatively few observers have been fortunate enough to witness this elaborate form of courtship which has rarely been photographed, being the least often performed of this species' four main ceremonies (first described fully and named by J. S. Huxley in *Proc. Zool. Soc. London*, 1914, pp. 491-562). As in the far more common Head-shaking, the male and female grebe play identical rôles in the Penguin-dance, whereas in the Discovery and the "Display" ceremonies the rôles are different though interchangeable.

Penguin-dancing usually occurs in the vicinity of the nest-site, within the territory of the pair, and is almost invariably preceded and followed by a long bout of intense Head-shaking in which Habit-preening is absent. The two birds dive and, while submerged, collect a bill-full of ribbony water-weed. On emergence, they swim towards each other with their tippets fully spread and, when quite close, both rear up out of the water simultaneously. They then meet breast to breast with only the very end of the body in the water, feet splashing to keep up, as shown in the photograph. As they sway together thus for a few seconds, they waggle their heads, gradually dropping the weed. After the normal Head-shaking which follows, the pair sometimes swim to the nest-platform where soliciting and copulation may occur.

Penguin-dancing has quite a restricted "life" in the reproductive-cycle, unlike the other ceremonies, being more or less confined to the stage before egg-laying. My work has shown, however, that none of the ceremonies last throughout the cycle as has often been implied by writers on bird-courtship. Three (the Discovery, "Display" and Penguin-dance Ceremonies) cease entirely when incubation begins, even Head-shaking being comparatively rare and of low intensity after egg-laying. Unlike the others, the Penguin-dance seems never to be performed by birds actually in the process of pairing-up, though there is evidence that grebes paired together for the very first season are far more



likely to go through this ceremony, once established at a nest-site, than old pairs.

There are records of Penguin-dancing in other species of grebe, including the Black-necked Grebe (*P. nigricollis*), Slavonian Grebe (*P. auritus*), Red-necked Grebe (*P. griseigena*) and Western Grebe (*Aechmophorus occidentalis*).

(A project has been started by W. N. Charles, assisted by the writer, to photograph all the displays of the Great Crested Grebe. So far, series have been taken of activities at the nest-site and of Head-shaking and threat. There is one photograph of the Penguin-dance at the stage just before the clash together.) K. E. L. SIMMONS

**Collared Dove in Surrey.**—On 15th April 1956, at Gomshall, Surrey, I found a dove with a dark half-collar; and subsequently, on the 29th, I identified it as a Collared Dove (*Streptopelia decaocto*) by means of the darker primaries compared with the general coloration of the back. Later visits to the area were paid in the company of Dr. W. Rees-Thomas and family, and Mr. P. Holness; the bird, which was considered from its behaviour to be a male, was then seen at much closer range and also heard calling. Mr. D. Freshwater observed it as well, on another occasion.

Initially, I found field-identification difficult because of the effects of shadows cast by twigs, and it was necessary to see the bird side-on in a good light in order to distinguish the primaries. When I obtained an extremely good view with a telescope at a range of some 20 feet, I could see that the edges of the primaries were abraded, so that the true colour was not always clear. There was no doubt that they were darker than the general coloration of the rest of the wings and the back, although I would not describe this feature as conspicuous. The pinkish tinge to the breast was also visible when the bird was close at hand, but was not obvious in a normal view, particularly against the sky. The bird had struck me as differing from the domesticated Barbary Dove (*S. risoria*), not only on these features, but also on first impression because of the greyer colour of its back, an impression that was strengthened during later visits. The eyes looked dark and even through a telescope I could not observe the red colour referred to in the *Field-Guide*. Dr. Rees-Thomas, however, caught a glint of red when a ray of sunlight momentarily fell on one of the eyes. The bill was dark, and the legs were pink and unadorned with any form of ring.

The typical call of the species, "coo-coooo-cuk", with the accent on the second syllable, was unmistakable, although occasionally the hard "c" of the coo was softened to a guttural "chroo-chrooo-cuk". A flight-call consisting of a sort of low-pitched shriek (my rendering was "hurrrr") was also heard.

The bird paid regular visits to feed in a chicken-run in the

garden of a local house, and Mr. V. H. Lacey, the occupant, stated that the bird had been observed there since 6th April. Dr. Rees-Thomas took advantage of this feeding-habit to obtain a colour photograph by using one of the hen-coops as a hide. The bird was last observed on 13th May by which time it had taken territorial possession of an elm, was in full song and disputed the right of other species—Mistle Thrush (*Turdus viscivorus*), for example—to use the tree. The aggressive display consisted of inflating the crop, lowering and spreading the tail, and calling loudly when approaching the intruder. G. H. FORSTER

[There can be no reasonable doubt now that the Collared Dove has reached this country as a wild immigrant from the Continent (see pp. 239-246), but as some of this species were imported by at least two dealers in the early 1950's, though not apparently since 1952 (*antea*, vol. xlvi, p. 55; and vol. xlix, pp. 345-346), there must remain a possibility that isolated occurrences like that described above refer to captive birds that have escaped. It should be added that Dr. Rees-Thomas's photograph mentioned in Mr. Forster's note clearly supports this bird's identification as *decaocto*.—EDS.]

**Return of Great Grey Shrike to winter territory.**— For four consecutive winters (1953-56) a Great Grey Shrike (*Lanius excubitor*) occupied a territory in a little valley and the surrounding bushy waste ground near Northwich, Cheshire, where it was seen by many observers. This species is not often seen in the county and had never previously been recorded within a number of miles of this spot. The fact that it was to be seen in the same area and often on precisely the same twigs each winter made it increasingly probable that it was the same bird each time.

It was first noted on 17th January 1953 by Bruce Campbell, W. B. Alexander and myself, but had probably been there for some time before that. It was seen regularly, often on the same bush, until 20th April 1953, always within 500 yards of its central roosting-places in low bushes and generally within 100 yards of its favourite perch.

It was first recorded in the next winter by W. Dutton on 6th December 1953, and from then frequently until 18th April 1954. As in the spring of 1953, it was far more settled in the last 3 weeks of its stay than in the previous 3 months, and remained in almost the same spot day after day until it disappeared.

In the winter of 1954/55 it was first seen, again by W. Dutton, on 1st December 1954. It wandered rather more during this winter, and once I watched it fly for exactly three-quarters of a mile direct to a disused rubbish-dump at the edge of the town, where I found it perching on an elder-branch. I saw it last on 9th April 1955, but I then went abroad and cannot give the final date of its stay.

On 6th November 1955 (its fourth winter) E. Liddle and I saw it again and from then at intervals until 19th April 1956. During this winter it was more unsettled than in other years, owing to the presence of workmen in the area it haunted.

It is noteworthy that in three of these four winters it was last seen on 20th, 18th and 19th April. Diligent search has failed to find it in the past winter (1956/57).

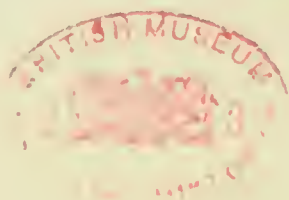
#### *Habits.*

Its regular practice was to drop from its perch into the long grass and dead weeds that cover this rough, largely derelict ground, and to disappear completely from view, often for a long time. Evidently it ate its prey on the ground, for it rarely came to a perch to eat it. On 19th April 1953 it did return to a perch with what looked like a beetle. On 1st April 1954 I watched it hover at about 10 feet from the ground, catch a large insect, perch on a sapling and slowly eat its capture, continually moving its mandibles until the insect had gone. A Chaffinch (*Fringilla coelebs*) remained quite undisturbed within 2 or 3 feet of it all the time. It was seen by W. Dutton to kill a Great Tit (*Parus major*) on 13th December 1953, and on 13th November 1955 S. Stanley and I watched it chase a Meadow Pipit (*Anthus pratensis*) high into the sky, shooting up vertically with fanned tail, but the pipit repeatedly evaded it and the shrike gave up the chase and settled on a bough when a second pipit joined the first. The only other item of food with which it was seen was a long-tailed mouse (probably *Apodemus sylvaticus*). S. Dobson, who reported this, noticed that it carried the mouse in its beak by the back of the neck. Once we watched it throw up a pellet after perching motionless for a time.

From time to time it was seen to hover, usually at only 2 or 3 feet above the long grass, but once I watched it hovering at over 20 feet from the ground for a considerable time.

It was heard to call and sing only once (17th April 1954), by G. Trelfa and me: a double note "tick tick" and a clear musical note several times repeated which (to my mind) resembled the piping note of a Bullfinch (*Pyrrhula pyrrhula*), but rather louder. This we heard from the distance of only a few yards. A. W. BOYD

[It seems quite possible that Great Grey Shrikes not infrequently return to the same territory in successive winters and there is the well-known case of the Berkhamsted Great Grey Shrike which spent three winters (1940-42) on the same common (*antea*, vol. xxxvi, pp. 51-53). However, only in special circumstances, as in that case and the one described by A. W. Boyd, can one be reasonably sure that the same bird is involved.—EDS.]

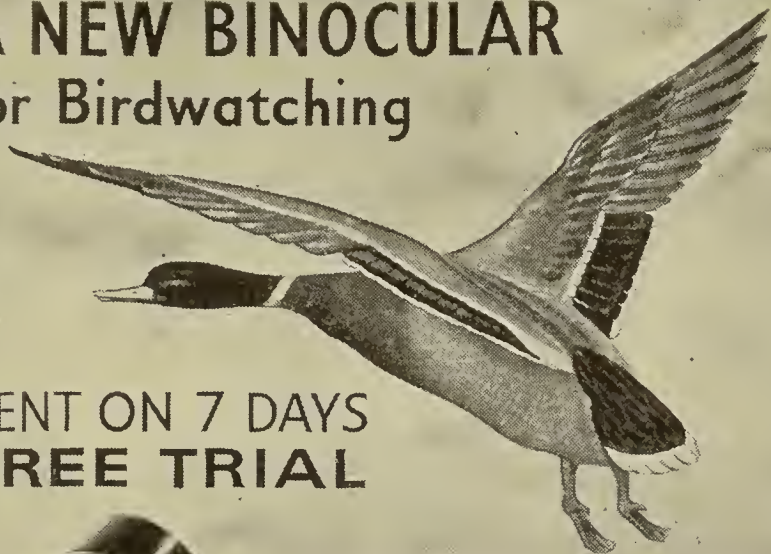


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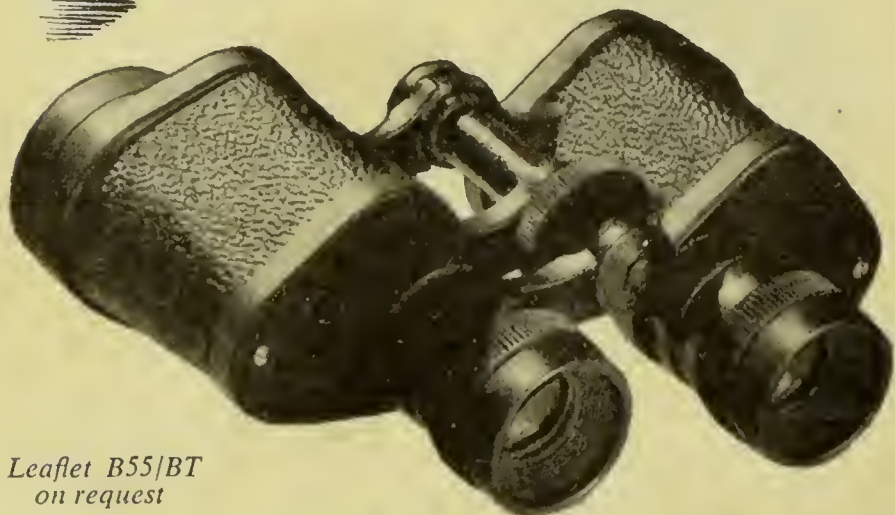
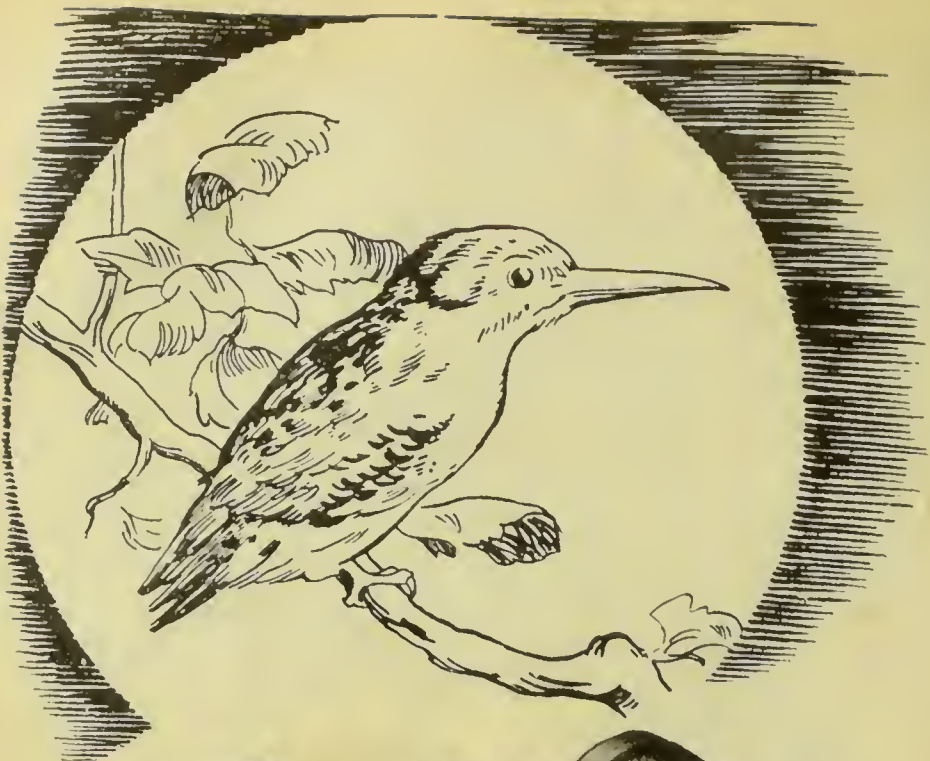
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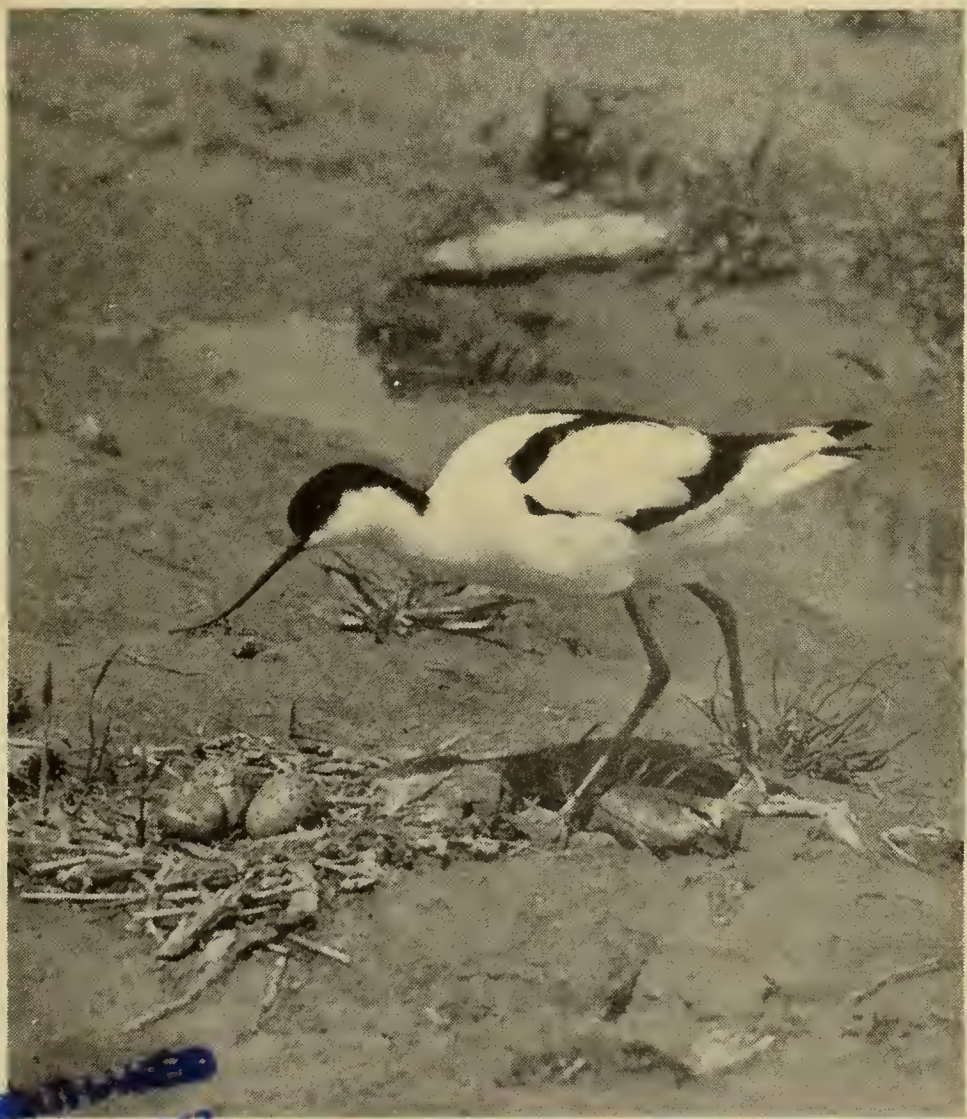
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# BRITISH BIRDS



JULY 1957

THREE SHILLINGS



# BRITISH BIRDS

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## CONTENTS OF VOLUME L, NUMBER 7, JULY 1957

---

	PAGE
Notes on nesting Nightjars. By Dr. David Lack ... ..	273
Bird foods and feeding-habits as subjects for amateur research. By Dr. John Gibb and the Rev. P. H. T. Hartley ... ..	278
Further aircraft observations of birds in flight. By Capt. K. D. G. Mitchell	291
Notes:—	
Early sexual maturity of a female Mallard (Hugh Boyd) ... ..	302
Quail swimming (J. A. Bailey) ... ..	303
Oystercatcher and Dunlin nesting near Manchester (A. W. Boyd) ...	303
Dowitcher in Co. Wexford, Ireland (H. Ennion, Major R. F. Rutledge and T. J. Underwood) ... ..	304
Upland Sandpiper in Co. Wexford, Ireland (H. Ennion, Major R. F. Rutledge and T. J. Underwood) ... ..	304
The unusual death of a late Glaucous Gull in Shetland (C. K. Mylne)	305
A feeding-method of Black-headed Gull (J. H. Flint and I. M. Walker)	306
Swallows feeding on torpid flies (D. I. M. Wallace) ... ..	306
Brown-and-white Willow Warbler breeding in Ross-shire (H. G. Alexander) ... ..	307
Reviews:—	
<i>The Bird Watcher's Reference Book.</i> By Michael Lister ... ..	308
<i>They Tell of Birds.</i> By Thomas P. Harrison ... ..	308
Letters:—	
The collection of records for analysis (John Robbins) ... ..	309
House Sparrows in the desert (Guy Mountfort) ... ..	311
Ringling in Egypt (Col. H. G. Brownlow) ... ..	312
Sight recoveries of marked Oystercatchers (E. J. M. Buxton) ... ..	312
The disturbance of the Ospreys in Scotland (Eric Simms) ... ..	312

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Cover photograph by Stuart Smith: Avocet (*Recurvirostra avosetta*) at nest.

3 JUL 1957

VOL. L

No. 7



JULY

1957

## BRITISH BIRDS

### NOTES ON NESTING NIGHTJARS

By DAVID LACK

(Edward Grey Institute, Oxford)

#### INTRODUCTION

THE following observations were made in late June and early July 1952-56, round Westleton in Suffolk, where Nightjars (*Caprimulgus europaeus*) breed not uncommonly on sandy heaths dissimilar to those where I studied the species fifty miles N.N.W., round Holt in Norfolk, twenty-five years earlier (Lack, 1930a,b, 1932). At Holt, most nests were found by tramping, especially through ground previously burnt and covered with light bracken on the edge of a stretch of heather. Round Westleton, with denser and more varied vegetation, tramping proved quite unrewarding. Several nests with eggs were found by watching the male fly up to relieve the female at dusk. A few with young were found because the parents came clucking round after dark, but some pairs did this well over a hundred yards from their nest, necessitating a long search afterwards. The nests were placed in heather or bracken, sometimes amid young birch trees. In 1955 and 1956, Head Forester Parker of Dunwich State Forest showed me several other nests found during Forestry operations in young plantations on the heaths.

In 1954, a bird with a clutch of two dissimilar and distinctive eggs laid only four feet from where a similar clutch was laid two years earlier, presumably by the same individual. In 1955, a pair bred some ten yards from where there had been a clutch two years before. Other sites were not re-occupied in this way.

#### START OF LAYING

Assuming an incubation period of 17 days (see later), and that the young first split their quills on the 8th day after hatching (repeatedly checked), the date of completion of each clutch found at Westleton, omitting second broods, was as follows: 24th and 27th May, 1956; 4th, 6th, 6th, 8th, 15th, 16th, 23rd and 27th June, 1952-55. Corresponding figures at Holt were 5th, 19th and

24th June, 1926-27; 4th, 4th, 6th, *ca.* 6th, 13th, 13th, 15th and 19th June, 1928; two in late May, 1929; 31st May, 9th, 9th, 11th, 17th, 22nd and 24th June, 1930. Hence in 1929 and 1956, the clutches were started in the last week of May, in other years mainly in the first half of June. Clutches laid in the second half of June were presumably repeats after loss of an earlier attempt.

#### SECOND BROODS

As discovered at Holt (Lack, 1930a,b), at early nests the male takes over the young by day when they are about a fortnight old and the female then lays again. Dates for the male's first appearance at four nests at Westleton were 27th and 28th June in 1956 (an early year), also 5th July 1954, and 11th July 1955; the age of the younger chick at the time was 17, 15, 12 and 16 days respectively, more variable than recorded earlier at Holt. At another nest, not precisely dated, the second clutch was completed by 11th July 1953.

For comparison, at Holt the male took over between 5th and 17th July at five nests during 1926-28, on 25th June and 1st July at two nests in 1929 (an early year), and on 30th June and 17th July at two nests in 1930. The age of the second chick at the time was usually 13 days, once 11 and once 10 days (*cf.* Lack, 1930a,b). Summarising the results for both areas, second broods were started in the last week of June in the two early years (1929 and 1956) and usually in the first half of July in other years, the latest record (twice) being 17th July. The age of the younger chick when the male took charge varied between 10 and 17 days.

One female at Holt, also one in captivity (Heinroth, 1909), laid the first egg of the second clutch on the day that the male took charge of the first brood. But at Holt another male first brooded on 30th June, and the female laid again on 2nd and 4th July, while another male first brooded on 7th July, when the female was found roosting where she would later lay, and she laid there on 8th and 10th July. (This slightly corrects the account in Lack, 1930b.) Similarly in 1956 at Westleton, a male first brooded on 27th June, the female was found roosting 90 yards away on 28th June, and laid in a new site 60 yards from this roosting-place and 90 yards from the first brood on 29th June and 1st July. Hence there is sometimes a delay of one or two days between the male's brooding and the female's laying again.

At Westleton, second broods were 75, 90 and 290 yards from their respective first broods. The last pair bred on an extremely open heath. Corresponding figures at Holt were 30, 80, 100 and 160 yards. On 7th July 1952, I also found at Holt a female brooding two eggs, with two well-grown young (but no male) beside her. Similarly on 16th July 1920, a female was found with well-grown young and a single egg, a second egg being laid later (Attlee, 1928). These two records might be attributed to the male having died, but as noted below, he was sometimes irregular in brooding the young.



Thus at one nest in 1930, the male stayed with the first brood by day for only three days, after which he retired to a well-used roosting-place sixty yards away, presumably his old one; he continued to feed the first brood and to relieve the female on her second clutch at dusk. At Westleton, again, the female left a brood when the younger chick was 10 days old and started a second clutch a little later (not precisely dated); after the female left them, the first brood was not attended by day, though the male was active in feeding them at dusk. Another brood was left unattended by day when the second chick was 12 days old, but a second brood was not found; both parents fed the young at dusk, so there may not have been one. At a late nest in 1930, the female left her young unattended by day during their third week.

#### TIME OF LAYING, AND INCUBATION-PERIOD

As mentioned above, in two second broods in 1930 and one in 1956, the two eggs of a clutch were laid at an interval of two days. Observations at three nests at Westleton showed that the second eggs were laid some time between 10.30 a.m. and sunset. At one of these nests, the second egg hatched 17 days after it was laid. Earlier records suggest that 17 days may be the undisturbed incubation period (Lack, 1930).

#### WEIGHT OF EGGS AND YOUNG

In four instances I found that a fresh egg lost 0.1 gram from one day to the next. The eggs in three clutches were in each case weighed one day after laying, and, adding 0.1 gram to each figure, their weights at laying were 8.0 and 8.2 grams, 8.0 and 8.6 grams, and 7.5 and 7.8 grams. In the first two of these clutches, the first egg of the clutch was the lighter of the two (in the third this point was not checked). Another fresh set weighed 8.4 and 9.0 grams when found. This gives an average weight of 8.2 grams for eight fresh eggs.

An egg of 8.6 grams when laid weighed 7.4 grams when chipping, a loss of 14%. Other chipping eggs weighed 6.1 and 7.2 grams (same clutch), and 6.5 grams. Six newly hatched young, dry but prior to their first feed, averaged 5.8 grams, ranging from 5.1 to 6.8 grams, a surprising spread. The average daily weight in grams from the 1st to 18th day, for all available young in 1952-56, in varied types of summer weather was: 5.8, 9.7, 12.6, 17.0, 21.2, 26.3, 30.3, 35.1, 39.0, 43.7, 45.4, 48.6, 51.0, 52.7, 54.3, 54.6, 55.6 and 57.9 (based on 7-10 individuals, except for the 18th day with only 3). This shows that the average weight rose markedly each day up to the 11th, after which the proportionate daily increase was smaller. The average weight continued to rise up to the 18th day, when it was rather less than three-quarters of the average adult weight of 80 grams (Niethammer, 1938), so that the increase presumably continued for some time longer. Young Nightjars can fly a short way when

a fortnight old and for at least fifty yards when 18 days old. Hence they resemble nidifugous and differ from nidicolous young in continuing to increase in weight after they have left the nest and are capable of flying well.

Chicks of the same age varied somewhat in weight, on the 11th day, for instance, between 38.9 and 50.3 grams. Up to the 14th day, however, every nestling was heavier each day, whether the night had been warm or cold, wet or fine, in marked contrast, for instance, to a young Swift (*Apus apus*), which loses weight in bad weather (Lack, 1951). Evidently the weather has much less effect on the numbers of crepuscular than of diurnal insects. In particular, the dusk-flying insects remain common on wet nights, in which some young Nightjars increased markedly in weight. From the 14th day onward, a chick was occasionally lighter than it had been on a previous day, though increasing again later.

#### NEST-RELIEF

My wife and I watched regularly at different nests at dusk. Typically, the male flies up, calling "co-ic", to relieve the female on the eggs, covering them until she returns after her feed. But this behaviour is very variable. Sometimes the male sat for at least forty minutes, after which we left because it was too dark to see more. At other times he left before the female returned, while at one nest, though he sometimes relieved his mate, on other nights he did not come and the female left on her own. On one occasion, a male which normally sat well left the eggs after 7 minutes to chase away another male flying near, and did not return. The time of relief on seven fine nights between 28th June and 8th July in different years was 8.39 p.m. G.M.T. (limits 8.28-8.43), on the average 13 minutes after sunset. On dull evenings the male came up to five or ten minutes earlier. On 3rd July 1955, it became exceptionally dark about 8 p.m. G.M.T. because a heavy storm came up from the west, and a male flew in to relieve his mate at 8.04, 35 minutes ahead of his time on fine nights that year. The female came back on the eggs at 8.43, after which the male left and sang.

In a dawn watch on 2nd July at one nest with eggs, the female left at 2.28 a.m. G.M.T.; the male came on at 2.33 but left after four minutes and sang; the return of the female was not seen; she left again at 2.50, returning five minutes later, and at 3 a.m. the male flew up, hovered low over the nest and went off, after which all was quiet.

#### WING-EXERCISES

As discovered by Tutt (1955), young Nightjars exercise their wings at dusk. My wife and I watched this from a hide four feet from a nest in 1955. When the chicks were 9 and 10 days old, they merely ran. When 12 and 13 days old they hopped with the help of the wings to a height of 10 to 15 inches, starting and ending with the wings fully extended on the ground. When 15

and 16 days old, they flew up two to four feet, circling round some three feet, and landed on the nest again. Control was already developing, since one of the young caught a moth in the air. When the young were 17 and 18 days old, they flew up to eight feet off the ground and sometimes landed away from the nest, then flying in again, and all feeds took place on the nest. When they were 20 and 21 days old, each flew strongly away from the nest at dusk, but when an adult came over calling, one of the young responded with its food-call, a harsh "see-arr" and flew back to the nest, where the female fed it. After this it flew off again. The young of many species exercise their wings before they can fly, presumably to strengthen the flight muscles. It would probably be too dangerous for such unprotected and edible morsels to do this on an open heath in daylight, so young Nightjars exercise their wings mainly at dusk. They fly chiefly up and down, or up, round and down, because the nest is typically in a small open space amid vegetation in which they might be caught up if they landed in it.

## SUMMARY

1. In Suffolk and Norfolk, Nightjars start laying in the last week of May in some years and in the first half of June in most years. Second broods are started in the last week of June in early seasons, otherwise in the first half of July.

2. The second brood was placed from 30 to 290 yards from the first, but in two cases the young were beside the new clutch.

3. The first egg of the second clutch is laid either on the day that the male first attends the first brood by day, or one to two days later. The eggs are laid at a two-day interval. Incubation took 17 days.

4. The chick increases steadily in weight, not decreasing in bad weather, and is less than three-quarters of the adult weight when it can fly quite well.

5. The behaviour at nest-relief at dusk is variable.

6. The wing-exercises of the young at dusk are described.

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# BIRD FOODS AND FEEDING-HABITS AS SUBJECTS FOR AMATEUR RESEARCH\*

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IN THE STRAIGHT-FORWARD, descriptive natural history of any species, the food which it eats is an obvious item. The century and a half of scientific ornithology which has followed *The Natural History of Selborne* has seen the compilation of qualitative dietaries of most British birds: the "Food" sections of *The Handbook* (Witherby *et al.*, 1938-41) give an outline of the food eaten by each species. But it is all too easy to go on adding "new" records, with a genuine risk of obscuring knowledge rather than advancing it. As the late Prof. Sir Edward Poulton used to point out in lectures, men in desperate straits have eaten leather belts and tallow candles; but it is doubtful if these articles should be included in the dietary of man without some explanatory comment! The scant value of casual records of bird foods as published in the journal literature was demonstrated when one of us (J.G.) abstracted all such records from the first 32 volumes of *British Birds*: the sole entry under Fieldfares (*Turdus pilaris*) was of a single bird eating gooseberries in August (Frohawk, 1907).

*The Handbook* quotes estimates of the proportions of different foods in the dietaries of certain species. Many, though not all, of these records are based on the work of the late Dr. W. E. Collinge (1924-27), whose approach was dominated by "economic" considerations, and many of whose conclusions, it must be added, have not been confirmed by later workers. In the present state of knowledge it is futile to try to decide the "economic status" of most species, for the necessary information simply does not exist (Hartley, 1948a). In fact, the proportions of different foods in the diet of most species of birds are still all to learn: and it is in this quantitative—numerical—study of foods and feeding habits that the amateur ornithologist can make important contributions to bird ecology and ethology.

Since the investigation of a complete diet in both qualitative and quantitative aspects calls for that specialized training and those extensive library facilities, which, in these days, are usually only at the disposal of the professional zoologist, it will usually be more rewarding for the amateur scientist to concentrate upon a single facet of feeding biology. The immediate aim may be either to tell the "plain tale" of a relation between predator and prey as

\*In March 1956 (vol. xlix, pp. 97-106) we published a comprehensive review by the Rev. Edward A. Armstrong on "The amateur and the study of bird display". That was the first in a series of papers that we have invited as a reappraisal of the state of knowledge regarding various aspects of British ornithology. The present paper is the second in the series.—EDS.

part of the biology of a single species, or as a problem of ecology to compare the feeding habits of one species with those of another.

#### METHODS OF STUDY

In the 19th century the food of birds was studied almost entirely by the examination of crop and stomach contents: and there are many problems which can be solved only by this method. But a revulsion from the "collecting" of birds is nowadays characteristic of most amateur (and much professional) ornithology. This paper will not, therefore, include discussion of the analyses of crop and gizzard contents (see Hartley, 1948b, for a treatment of this subject).

Birds frequently eat foods so distinctive that they can be identified while being eaten: but only rarely can all the important foods of a species be ascertained by field observation (*cf.* Gibb, 1956). The accuracy of field identification of foods varies greatly from group to group: for example, it is probably necessary to lump all "earthworms" together, while "ants" can often be specifically identified by visiting the plundered nests and "wild fruits" can be identified with ease. This implies that field methods alone are unsuitable for the study of total dietaries: but there remain many other problems of feeding ecology in which field identifications of foods are of the greatest value.

The study of the food of predatory birds by the examination of their pellets is a method which has long been known. Pellets provide a good measure of the occurrence of vertebrates and of such heavily chitinized arthropods as beetles in the diet, but they cannot be relied upon to reveal soft-bodied preys. In the Heron (*Ardea cinerea*), a study of pellet contents over-emphasizes the importance of mammals among vertebrate preys, for a Heron is capable of digesting most species of fish completely. Similarly birds' faeces rarely, if ever, provide material for a complete assessment of the diet of a species, but their contents may provide useful clues, or confirm the tentative field-identification of certain foods. The value of information which may be obtained from birds' droppings has not been sufficiently recognized (Gibb, 1956).

The food of nestlings can usually be studied more closely and more continuously than that of free-flying birds, and their foods can be identified in a variety of ways. Some raptors, for example, habitually bring to the nest more food than their young can eat. The young of other species, such as Herons and Cormorants (*Phalacrocorax carbo*), can be induced to disgorge their gizzard contents; and nestling Swifts (*Apus apus*) yield their latest meal when their throats are massaged (Lack, 1956).

Direct observation is sometimes sufficient to identify foods brought to the nest, but usually these identifications should be checked by the collection of samples. Betts (1953, 1956) used an artificial nestling gape to collect food samples: this technique demands specialized knowledge to identify the specimens obtained,

and its use calls for some skill. The normal feeding methods of the parents must have been studied carefully. Kluijver (1933) obtained samples of the foods of nestling Starlings (*Sturnus vulgaris*) by placing collars around their necks, so adjusted that the food could not be swallowed. The use of nest-boxes with glass backs has proved a most valuable technique for the study of the food of hole-nesting birds (Tinbergen, 1949; Betts, 1955).

High-speed flash photography can record conspicuous foods (Hosking and Newberry, 1940), and may be more reliable than direct observation: it has obvious advantages with nocturnal species. Southern (1956) identified the foods brought to the nest by Tawny Owls (*Strix aluco*) with the aid of a red flood light, by which the birds are not disturbed, and binoculars.

The bird ecologist must be the antithesis to the Athenians of old who "spent their time in nothing else but either to tell, or to hear some new thing" (Aets, xvii: 21). It is by "the stark observation, repeated" (Gibb, 1956) that the study of the feeding habits of birds will be advanced. Long series of observations, compared, contrasted and correlated may reveal quite unsuspected specializations and adaptations.

The basic assumption of all field investigations of this type is a simple one—that it is as easy to record a certain food or facet of behaviour at one time of the year as at another. When two species are to be compared this assumption must be put to careful test. For example, since there is no great difference in the "boldness" of Song Thrushes (*Turdus philomelos*) and Mistle Thrushes (*T. viscivorus*) when feeding in trees, their relative utilizations of the crop can properly be studied in the field (Hartley, 1954). But when feeding on the ground, the Mistle Thrush is a much less approachable bird than the Song Thrush, so that a comparison of the importance of earthworms in the diets of the two species would be an unsuitable subject for field study.

The basis of recording is worth considerable thought, and may be varied with the object of the study. In studying the activities of Jays (*Garrulus glandarius*) hiding acorns (cf. Goodwin, 1951), the number of acorns seen to be carried away or buried is the obvious statistic; but when comparing the consumption of acorns by several species the number of birds seen at work may be the more suitable record. "Number of morsels eaten" is a measure which has the disadvantage of rivetting attention upon a single bird which may, or may not, be behaving typically.

The aim of the research will, to some extent, decide how figures may reasonably be massed. When there is no consistent observation in any one area the total data for each period of observation may be grouped, the aim being only a first generalization upon seasonal variation. But when most of the observations are made in one locality the inclusion of a small body of data from another area may be highly misleading.

It cannot be too strongly emphasized that the mere presence of



a bird in a fruiting tree is not evidence that it is feeding there: thrushes will often sit and drowse on a laden branch without touching a fruit. The bird must be watched actually seizing or swallowing the food.

The fact must be faced that it is often impossible to identify the food of birds in the field: but a great deal can be learned from precise, quantitative descriptions of the places where birds feed, and the methods whereby prey is found and prepared. When such a study is followed by careful scrutiny of favoured hunting-grounds, it may be possible to discover the actual food. But beware of jumping to conclusions!

#### DIETS

It is probable that no bird is so specialized that its diet remains unchanged from season to season and from place to place. Some long-term changes in diet may be associated with an altered status or distribution: Fisher (1952) has drawn attention to the coincidence between the spread of the Fulmar (*Fulmarus glacialis*) and the recently-acquired habit of feeding on fish-offal from trawlers. Many examples spring to mind of seasonal or climatically conditioned variations in the diets of familiar species—for example, Song Thrushes seek hibernating snails in hard winters, but not when the season is “open”—but few of them are adequately documented. Shorter-term changes from month to month, from day to day, or from hour to hour, may not be so immediately apparent: thus Blackbirds (*T. merula*) in autumn specialize on earthworms in the early morning (Hartley, pers. obs.), as do Starlings in spring (Dunnett, 1955).

Spatial differences in diets are on a similarly variable scale—from differences between diets in one part of the species' range and another, down to others between neighbouring territories. It is usually those at the latter end of the scale that are least understood and, incidentally, most susceptible of amateur investigation. There are, in addition, purely individual food preferences such as those displayed by male and female Great Tits (*Parus major*) of the same pair (Tinbergen, 1949). This is an almost unexplored field, ideally suited to amateur research upon a colour-marked population.

It is an axiom of modern thought on evolution through natural selection that no two species of animal having identical ecological requirements can live together in a single habitat (Gause, 1934). In birds the most obvious differentiation that has been evolved between species in one community has been in their feeding habits (see refs. in Lack, 1954). For example, when Rock Pipits (*Anthus spinoletta*), Purple Sandpipers (*Calidris maritima*) and Turnstones (*Arenaria interpres*) are feeding side by side upon the same species of periwinkle (*Littorina*) each species selects specimens of different size (Gibb, 1956); Dewar (1940) found similar differences in the selection of limpets (*Patella*) and mussels

(*Mytilus*) by Turnstones and Oystercatchers (*Haematopus ostralegus*).

#### FEEDING STATIONS

The description of feeding stations should define in precise terms the places where food is sought. It has long been known that titmice (*Paridae*) feed in woodlands, but only recently has it been shown that each species has characteristic foraging-places, differing from those of its congeners. These differences include the exploitation of different trees within the habitat (Snow, 1949), hunting at different levels (Hartley, 1953) and searching in different parts of the trees (Gibb, 1954). Lockie (1955) showed that Jackdaws (*Corvus monedula*) hunt in longer grass than do Rooks (*C. frugilegus*), and that Carrion Crows (*C. corone*) will hunt in rougher herbage still.

The definition must also be in terms of time. For example, many titmice and Woodcock (*Scolopax rusticola*) desert the breeding woods in late summer (Gibb, 1954b; Seigne, 1930). Rock Pipits feed most commonly below the extreme high water mark of spring tides in winter and among the herbage on the cliff-face in summer (Gibb, 1956). These seasonal variations may differ locally: Rock Pipits living in the bays feed consistently more below the high water mark than do their neighbours on the headlands (Gibb, 1956); and in east Suffolk, but not in Berkshire, Song Thrushes leave their breeding-quarters for some weeks in late summer (Hartley, pers. obs.).

#### FEEDING HABITS

The methods whereby birds seek and, when necessary, prepare their food are largely undescribed. Most of the exceptions to this generalization contain an element of the remarkable: the use of anvil stones by Song Thrushes (Morris, 1954) and bower-birds (Marshall, 1954), of vices by Nuthatches (*Sitta europaea*) and Great Spotted Woodpeckers (*Dendrocopos major*) and of probes by *Camarhynchus pallidus* (Lack, 1947); the various methods used by Oystercatchers to prise off limpets (Gooch, 1935; Spooner and Moore, 1935); the dropping of tough preys to burst them open, and the washing of gritty foods by waders.

The hunting flight of the Sparrowhawk (*Accipiter nisus*) has been exactly studied by Tinbergen (1946); and Rudebeck (1950-51), in studies of several hawks, estimated the proportion of successful to unsuccessful attacks. In England, only 24 of 192 hovers by Kestrels (*Falco tinnunculus*) ended in a stoop to the ground (Hartley, pers. obs.). It might be rewarding to compare Kestrels' successes in years of vole plague and vole scarcity. The Egyptian form of the Kestrel (*F. t. rupicolaeformis*) spends more time in sailing in tight circles, and less in hovering than does *F. t. tinnunculus*.

The same food may be obtained differently by different species.

Mistle Thrushes picking terminal berries often snatch them with an upward lift in the middle of a sweeping glide, whereas Song Thrushes and Blackbirds usually hover fluttering to seize them. Titmice of the genus *Parus* clamp such large morsels as nuts and berries between their feet to hack at them, but Long-tailed Tits (*Aegithalos caudatus*) cannot hold a morsel on the perch, and when feeding on berries of spindle (*Euonymus europaeus*) will often hang upside down, holding on to a twig with one foot and grasping the berry in the other (Gibb, 1954).

The "footedness" of birds is almost unknown. A Blackbird was seen to dig first with one foot, then with the other, and a Reef Heron (*Demigretta schistacea*) was also observed to use either foot, but the right more often than the left, to stir tufts of weed to bolt small fishes (Hartley, pers. obs.). Captive Great, Blue and Coal Tits (*Parus major*, *caeruleus* and *ater*) were individually consistent in using one or the other foot to clamp mealworms to a perch, but the proportion of left and right-footed individuals in the population is not known (Gibb, pers. obs.). It may be mentioned that right-handed and left-handed monkeys occur about equally frequently (Rev. John Cole, private communication). Here is an ideal subject for investigation with colour-marked birds.

The extent to which some birds hide food when confronted with an abundant supply has only recently been realized. The most remarkable case is surely that of the Nutcracker (*Nucifraga caryocatactes*) which largely relies, both for its winter food and to feed its young in spring, on stores of hazel-nuts gathered in the previous autumn (Swanberg, 1951). Jays, titmice, Nuthatches, shrikes (*Lanius* spp.) and woodpeckers all hide food at times (refs. in Lack, 1954; also Haftorn, 1954, 1956; and Gibb and Betts, in progress). Practically nothing is known about how, how often and by whom hidden foods are retrieved: here, again, colour-marked birds are needed.

Fighting over food plays an important part in the feeding of many birds: the activities of skuas (*Stercorarius* spp.) have given rise to the ornithological cant phrase "to skua". The exploitation of feeding Lapwings (*Vanellus vanellus*) by Black-headed Gulls (*Larus ridibundus*) (Selous, 1927) is now well-known, though it is probable that the habit has evolved in the present century, since the gulls invaded inland feeding grounds. Hinde (1952) pointed out that supplanting attacks by tits, having food for their object, occur most frequently in mid-winter, when food may be short, and especially on occasions when the disputed morsel is large. Blue Tits rob Great Tits about as often as they are robbed by them: but both these species dominate Marsh Tits (*P. palustris*) and Coal Tits, and Coal Tits are submissive to all. From November to February, 1950-51, near Oxford, each Great Tit was attacked, on the average, some 5 times per hour, each Marsh Tit about 6 times, each Blue Tit about 15 times and each Coal Tit about 23



times: "hence some individuals may obtain and others lose, a large amount of food as a result . . ." (Gibb, 1954).

Blackbirds always dominate Song Thrushes: in a short series of observations in the springs of 1954-56, Song Thrushes lost about 9% (8 of 91) of their earthworms to Blackbirds, while some 5% (8 in 155) of all earthworms eaten by Blackbirds were plundered from Song Thrushes (Hartley, pers. obs.). In encounters between House Sparrows (*Passer domesticus*) and Song Thrushes kleptoparasitism tends to develop from commensalism. When, in high summer, Song Thrushes dig out chafers emerging from lawns, sparrows frequently attend to eat the limbs which the thrushes knock off; but some sparrows try to snatch the whole prey.

Several instances of commensalism between two species of birds are known. The most delightful is that of the bee-eater *Merops nubicus* which, on the East African plains, rides on the bustard *Choriotis kori* if no other perches be available (North, 1944). In winter, Chaffinches (*Fringilla coelebs*) will eat the pips of crab-apples hacked open by Fieldfares, and Robins (*Erithacus rubecula*) the kernels of walnuts cracked open by titmice (Hartley, pers. obs.). A number of feeding associations between birds and mammals have been described (e.g. North, 1944; Lack, 1948; Betts, 1955; Ogilvie, 1955). The use of grazing herbivores as "beaters" by insectivorous birds has long been known in general terms, and would repay detailed study.

#### FEEDING ROUTINES

Few field-studies have been made of the frequency and duration of birds' meals. Activity varies from the almost uninterrupted foraging of titmice and Rock Pipits in mid-winter (Gibb, 1954, 1956), through the one meal in 48 hours of Great Black-backed Gulls (*Larus marinus*) in the herring season (Rivière, 1930), to the fantastic fasts of some game and marine birds in the breeding-season (Goodwin, 1948; Stonehouse, 1952). Feeding routines are rarely fixed for long periods: as days lengthen and shorten, as supplies become abundant or scarce, so feeding behaviour changes.

In all work upon routines a record must be kept of opportunities for observations as well as of the activities of the birds, so that it may fairly be claimed that the observed variations are in the behaviour of the bird, and not of the observer! This precaution is not necessary when the size or habits of a species are such that resting and feeding birds are equally conspicuous—for example, gulls feeding inland, or Cormorants and Shags (*Ph. aristotelis*)—as their routines may be revealed by comparing the numbers of feeding and resting birds in each hour. Opportunities for observation may be recorded simply as "hours" or "days of observation", or—more exactly—as "minutes of observation per hour" or "number of 'spies' per hour", the 'spy' being an observation of fixed duration from a given point.

The regular observation of the presence or absence of feeding

birds on suitable terrain will indicate the regularity, or irregularity, and the duration of periods of feeding: with a colour-marked population the activities of individuals may be studied. The number of birds entering baited traps may or may not be a reliable measure of feeding activity (*cf.* Lees, 1947; and Owen, 1954). The number of birds feeding per unit time is not, of course, the only measure of foraging activity: Hartley and Fisher (1936) used the number of pecks per unit time to gauge intensity of feeding in marine birds; by a similar method, individual Rock Pipits were found to eat periwinkles and chironomid larvae at an average rate of 33 per minute, and isopods (*Idotea* spp.) at about 2 per minute (Gibb, 1956).

Automatic recorders have been much used at the nests of hole-breeding species to record the frequency of the parents' feeding visits and other rhythms (see, *e.g.*, Palmgren, 1949; Kendleigh, 1952; Gibb, 1955, 1956). Automatic recorders could easily be arranged to record the frequency of visits to a bait. Mechanized recording can provide a longer series of observations than is otherwise practicable, and minimizes the effects of the observer's own routine: but the machine cannot identify visiting species.

Bratby (1939) has shown that the ebb and flow of the tides, and not the alternation of light and darkness, control the activity of Wigeon (*Anas penelope*). Herons and many waders are noisy over the mudflats on the blackest of nights. Some species show local variations between nocturnal (or at least crepuscular) and diurnal habits: Herons and Moorhens (*Gallinula chloropus*) are notable examples.

By comparing field observations with the weights of the crop contents of birds shot at different times of day, Chapman (1924) concluded that the Red Grouse (*Lagopus scoticus*) took but one real meal in the day—in the afternoon. The weights of crop-contents given in the Grouse Report (1911) seem to support this view, but the authors of the report believed that feeding continued all through the day: a conclusion from which Chapman differed with characteristic emphasis! Woodpigeons (*Columba palumbus*) in late winter have almost empty crops by day and heavy cargoes at dusk: rough field observations do not suggest a restricted feeding period. Here is a fine problem for the sportsman-naturalist.

#### FOOD REQUIREMENTS

Practically nothing is known about the quantities of food which wild birds need to keep them in health; such slight information as is available has largely been derived from captive birds living under unnatural conditions. Opportunities for measuring the amount of food eaten by wild birds are rare indeed (*cf.* Gibb, 1956), but when an occasion does offer it should be grasped eagerly. It is seldom possible to choose the units in which the amount of food eaten is to be recorded, but a measure in terms of the number of

prey should, if possible, be accompanied by gross or average weights.

The frequency with which birds defaecate, and the weight of the material voided are almost unknown. Rock Pipits and captive Coal Tits both defaecated at the surprising average rate of once every 80 seconds (Gibb, 1956, and in progress). Nestling Passerines defaecate much less often than their parents (about once every 100 minutes in the case of Great Tits (Betts, 1955)), but their faeces are larger.

#### THE EXPERIMENTAL APPROACH

An enormous field lies open in the experimental study of the foods and feeding habits of birds, studies which call for no elaborate apparatus. This fascinating work is, therefore, particularly suited to the amateur naturalist. The only preliminary work is to accustom birds to feed within a certain area: experiments can then begin, though care should be taken not to place the "baits" so regularly at a single point that the birds come to expect everything placed there to be edible. The scene of each experiment should be as remote as possible from that of the preceding one.

There is much to be learned about the choices exercised by birds within their normal dietary. Beechmast, hazel-nuts and walnuts may be offered to titmice, Jays or Rooks; mice, voles, shrews and sparrows to the Corvidae; insects, woodlice, millipedes and spiders to many Passerines; and, in a stewpond only a few feet square, several species of fish and aquatic invertebrates to Kingfishers (*Alcedo atthis*). The higher vertebrates must, of course, be offered dead; but results from the offer of newly killed invertebrates may be compared with those from the liberation of a known population on a concrete or turfed island within a water channel. In such an "experimental island" the effects of conspicuousness can be gauged by varying the ground colour with scattered sand, charcoal or powder colour.

The effect of "custom" in the predator may be investigated. For example, Song Thrushes select naturally-coloured snails (*Helix aspersa*) in preference to more conspicuous specimens which have been brightly coloured (Hartley, 1954b). The possibility may be examined that birds seek preys of a certain size and reject more conspicuous morsels of the wrong dimensions. Morris (1955) showed that in the Zebra Finch (*Poephila guttata*) the preferences of the two sexes are rather different, the females always preferring yellow millet, while the cocks varied their choice from day to day.

The efficacy of "camouflage", warning coloration and of chemical and other weapons has long been classical ground for experiment (refs. in Cott, 1940), but much remains to be learned, by direct observations of choice (cf. Carrick, 1936) or by painting nauseous insects with cryptic colours and edible insects with warning patterns. The recent work of de Ruiter (1952) on Jays



and stick caterpillars and of Kettlewell (in press) on bird predation and "industrial melanism" in the Peppercd Moth (*Biston betularia*) are outstanding examples of the experimental approach. The key to success in this field is the combination of a simple problem and a meticulous technique.

Morris (1955b) has shown that Minnows (*Phoxinus phoxinus*) are preferred to Three-spined Sticklebacks (*Gasterosteus aculeatus*) by both Pike (*Esox lucius*) and Perch (*Perca fluviatilis*), and that this preference is due to the stickleback's defensive spines. Kingfishers come quite boldly to ponds in riverside gardens, so here is a fascinating line of research into their preferences, if any, by providing populations of fish mixed in different proportions, and counting the survivors from each experiment. A super-abundance of prey must be provided, lest the predator remove first the preferred species and then the less palatable, with the result that an actual selection would go undetected.

Thorpe's (1956) recent paper in this journal suggests all manner of intriguing experiments into birds' ability or inability to cope with unusual situations, experiments which distinguish innate capacity from power to profit by example. Buxton's (1948) observations on the acquisition of new feeding habits could be extended with profit over many species (*cf.* Fisher and Hinde, 1949; Hinde and Fisher, 1951).

The problems of how birds recognize their prey have, as yet, been scarcely touched. Song Thrushes carry empty snail-shells to their anvils and there leave them unbroken. Presumably no perception of weight warns the bird of labour in vain; but—again presumably—the noise made by the first tap is sufficient to halt the bird. Here is another problem markedly suitable for experiment.

In discussing predation rates, the question of availability—the proportion of the prey species accessible to the bird—is one widely open to experimental work. It is lifting oneself by one's mental boot-straps to measure availability by the frequency of capture. The effectiveness of different kinds of cover, the slenderness of twigs as a barrier to the hunting bird, the distance to which a snail or beetle must climb, or a larva be buried, to be safe from ground-feeding birds are all problems eminently suited for amateur research, calling for little else but persistence and liveliness of imagination. Let it not be forgotten that Charles Darwin was an amateur naturalist!

#### THE NUMBERS OF BIRDS AND THE AMOUNT OF THEIR FOOD

The problem of food shortage as a possible limiting factor upon bird numbers is scarcely amenable to part-time research, for attack upon it entails repeated measurement over many years not only of bird numbers but also of the amount of their food, as well as assessment of movements and of causes of mortality. As Lack (1954) has written, "It is scarcely surprising that, as yet, the

problem has not been adequately studied in any species, and that for most species none of the crucial facts are known".

The first step is to determine, for any single food, what proportion is eaten by the birds. This step is common to the problems of the significant control of the prey species by bird-predation and the limitation of bird populations by the supply of prey. Birds occasionally leave traces which provide "short cuts" to the solution of the problem "What proportion of their prey have the birds eaten?"

Sheppard (1951, 1952; see also Cain and Sheppard, 1952) calculated the population of the snail *Cepaea nemoralis* in a known area by a system (the Lincoln Index method) of marking, and recovery at Song Thrush anvils. The thrushes apparently ate some 5% of the snail population between 26th April and 10th June 1950, but none in the same period of 1951. It was shown that the ground-colour and degree of banding in this highly polymorphic snail varied with the habitat, and that the thrushes selected those specimens which were inappropriately coloured.

The larvae of the beetle *Pissodes* spp. are pests in pine forests, and spend the winter in chambers just beneath the bark of sickly trees. Great Spotted Woodpeckers locate these chambers beneath the bark (how ?) and drill small holes through which the larvae are extracted. By peeling off slabs of bark after the woodpeckers have been at work the numbers of the chambers that have been attacked and of those that have escaped can be counted. In one area of pine forest in the Netherlands, Voûte (1951) found that woodpeckers had eaten nearly all the larvae.

Great Tits and Grey Squirrels (*Sciurus carolinensis*), among other animals, eat hazel-nuts in winter, and both drop the empty shells close to their feeding-places. Shells opened by squirrels are characteristically scarred by their teeth, and are easily distinguished from those opened by Great Tits. Random collections of shells at the end of one winter in a mixed broad-leaved wood near Oxford, showed that the squirrels had accounted for some 60%, and the Great Tits for less than 5%, of the previous autumn's heavy crop (Gibb, 1954).

Blue and Coal Tits both eat the larvae of the eucosmid moth *Ernarmonia* (*Laspeyresia*) *conicolana*. The larvae winter just below the surface of ripening pine cones. When the moths or their parasites emerge they leave a neat round hole in the cone; but hunting tits rip open the larval chamber in an unmistakable way. Examination of the cones at the end of the winter reveals the number of larvae and their parasites which have survived, and the number of those that have been taken by tits. In the winter of 1955-56, in the Scots Pines of Thetford Chase, East Anglia, the proportion of chambers opened by tits ranged from about 30% to 70%, according to the number of larvae in the different plantations, providing a clear case of density-dependent predation by the tits (Gibb, in progress).

As field naturalists we must be constantly alert to detect "short cuts" such as these. The opportunities may occur but seldom, but when they do, they should be exploited to the full.

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## FURTHER AIRCRAFT OBSERVATIONS OF BIRDS IN FLIGHT

By CAPTAIN K. D. G. MITCHELL

### INTRODUCTION

THIS PAPER sets out observations of birds seen from aircraft (see Table I), subsequent to those published in my previous paper (*antea*, vol. xlviii, pp. 59-70). All observations are based on the same limitations and criteria of identification, height and so forth, as there outlined. Except where discussed below, these factors are not reiterated.

In the two years covered by this report (October 1954 to October 1956), a total of 65 observations were made; a total almost exactly equal to that of all previous years. The observations are of 17 species positively identified (of which eight are recorded for the first time); and, in addition, a further one of a species of crow, one of a finch or bunting, and one of an unidentified bird. Almost exactly 50% of the observations concern two species, Herring Gull\* and Swift. A further fifteen observations relate to two days in late March. These two species and two "record" days are discussed separately.

All observations have, as previously, been made from a Douglas DC 3 aircraft, which has a normal cruising speed of 160 m.p.h., and climbing and approach speeds of around 130 m.p.h. (though descent speeds from cruising height may initially be 20 to 30 m.p.h. above cruising speed). Rates of climb and descent are generally maintained close to 500 feet per minute. These—by modern standards—modest speeds have been of far greater value in making observations than the associated relatively low cruising heights, the majority of which, as is shown later, have been well above the heights where birds have been seen.

### HEIGHT

Again heights quoted are those above mean sea-level, the height of migrant birds being reasonably constant on such a basis, but

\*Scientific names are given with each species in Table I.

TABLE I—DETAILS OF OBSERVATIONS, OCTOBER 1954-OCTOBER 1956

Species	No.	Date	Local time	Place
Mallard ( <i>Anas platyrhynchos</i> )	12	27.3.55	1155	Havelsee, 8 miles W of Berlin, Germany.
Shelduck ( <i>Tadorna tadorna</i> )	2	8.5.55	1327	Jurby, I.O.M.
Buzzard sp. ( <i>Buteo</i> sp.)	1	7.3.56	1343	8 miles NNW of Milan, Italy.
	2	30.3.56	1027	Wahnerheide, Germany.
	4	„	1205	Brandenburg, Germany.
	4	„	1215	Gatow, Berlin, Germany.
Sparrowhawk ( <i>Accipiter nisus</i> )	1	26.3.55	0831	6 miles N of Hamburg, Germany.
Kite ( <i>Milvus milvus</i> )	2	21.4.55	1351	Bayonne, France.
	1	5.5.55	1600	3½ miles ESE of Bayonne, France.
Oystercatcher ( <i>Haematopus ostralegus</i> )	1	1.6.56	2025	Mid-way between Guernsey and Alderney C.I.
Lapwing ( <i>Vanellus vanellus</i> )	20	26.3.55	0812	14 miles NNE of Lübeck, Germany.
	40	„	0823	23 miles NE of Hamburg.
	8	„	0825	18 „ „ „ „
	20	„	0826	16 „ NNE „ „
	2	„	0830	8 „ N „ „
Great Black-backed Gull ( <i>Larus marinus</i> )	2	15.7.55	1605	Sinclair's Bay, Caithness.
Lesser Black-backed Gull ( <i>Larus fuscus</i> )	1	26.4.55	1731	Hounslow, Middlesex.
	4	29.4.55	1749	5 miles W of Stonehaven, Kincardine.
Herring Gull ( <i>Larus argentatus</i> )	1	15.4.55	1045	St. Peter Port, Guernsey, C.I.
	2	16.4.55	1605	5 miles NE of Glasgow.
	15	„	1633	Coupar Angus, Angus.
	30	„	1643	Laurencekirk, Kincardine.
	1	26.4.55	1400	Comber, Co. Down.
	1	29.4.55	1741	Aberdeen.



Height and heading indicated height in feet ; heading not always known)		Weather (cloud heights in feet ; wind direction in degrees from true north and speed in knots)	Remarks
600	SE	8/8 Cumulus, base 2,500. W/V 280/20. Light rain.	Depression centred to N.W. Birds flying just ahead of swiftly moving cold front. Thundery rain to S.
700	W	7/8 Strato-cumulus, base 3,500. W/V 220/25.	Extensive low stratus over adjacent sea.
800	Circling	No low cloud. Vls : 10 miles. W/V 090/10.	Height of ground : 700.
800	Circling	No low cloud. 7/8 Cirro-stratus above. Vis : 10 miles. W/V 180/15.	Height of ground : 300.
900			Part of second record day (see text).
900			
800	Circling	7/8 Strato-cumulus, base 6,000. W/V 210/20. Vis : 5 miles.	Part of first record day (see text).
800	Circling	5/8 Cumulus, base 3,800. W/V 300/12.	
700	Circling	No low cloud. W/V 340/15.	
600		No low cloud. W/V 300/15. Vis : 20 miles.	
500	SE	7/8 Strato-cumulus, base 6,000. W/V 210/20. Vis : 5 miles.	Part of first record day (see text).
500	E		
500	E		
500	SSE		
500	NE		
400		8/8 Strato-cumulus, base 4,000. W/V 260/10. Vis : 8 miles.	
400		3/8 Cumulus, base 3,500. W/V 300/10. Vis : 10 miles.	Immature bird.
400	E	No low cloud below. W/V 160/12. Vis : 10 miles.	Cumulus cloud banked against hills inland. Warm. Temp : 12°C. (53.6°F.).
300		7/8 Strato-cumulus, base 2,000. W/V 060/20.	
300		Light haze. No cloud. W/V 030/10. Vis : 8 miles. Anticyclone centred to N.	Ranges of hills to greater heights within five miles of each observation.
300			
300			
200		6/8 Cumulus, base 2,500. W/V 280/15. Vis : 15 miles.	
200		No low cloud. Vis : 8 miles.	

TABLE I—DETAILS OF OBSERVATIONS, OCTOBER 1954–OCTOBER 1956—(continued)

Species	No.	Date	Local time	Place
Herring Gull ( <i>continued</i> )	4	14.7.55	1400	Sinelairs Bay, Caithness.
	3	25.7.55	1605	Finchley, Middlesex.
	1	18.9.55	1523	20 miles N of Alderney, C.I.
	6	4.4.56	0730	Kastrup, Copenhagen, Denmark.
	1	13.4.56	1545	Pentland Firth.
	1	"	1550	Sinelairs Bay, Caithness.
	6	20.4.56	0913	Castletown Bay, I.O.M.
	1	11.7.56	1220	Renfrew Airport, Glasgow.
	1	12.7.56	1246	Aberdeen.
	13	13.7.56	1650	Newburgh, Aberdeenshire.
	4	"	1735	Aberdeen.
Black-headed Gull ( <i>Larus ridibundus</i> )	1	26.3.55	0828	12 miles NNE of Hamburg, Germany.
	1	20.5.55	0920	Christchurch, Bournemouth, Hants.
	4	18.9.56	1230	London Airport, Hounslow, Middlesex.
Swift ( <i>Apus apus</i> )	1	14.6.55	1950	Heston, Middlesex.
	2	22.6.55	1155	Tempelhof Airfield, Berlin, Germany.
	1	25.6.55	1448	Wasserburg, Bavaria, Germany.
	1	15.7.55	1705	2 miles N of Aberdeen.
	2	22.7.55	1130	London Airport, Hounslow, Middlesex.
	2	16.5.56	1706	Jimena de la Frontera, Spain, 20 miles NNW of Gibraltar.
	1	17.5.56	1645	London Airport, Hounslow, Middlesex.

Height and heading (indicated height in feet ; heading not always known)		Weather (cloud heights in feet ; wind direction in degrees from true north and speed in knots)	Remarks
800		6/8 Strato-cumulus, base 4,000. W/V 300/05. Vis : 25 miles.	
3,000	WNW	3/8 Cumulus, base 4,200. W/V 060/10. Vis : 10 miles.	
1,800	NNW	No cloud. W/V 290/15. Vis : 15 miles.	
500		No low cloud. W/V 350/15. Vis : 10 miles.	
700		No low cloud. W/V 040/10. Vis : 30 miles.	
800		As above.	
1,000		No low cloud. Vis.: 6 miles. W/V variable, light.	
800		4/8 Cumulus, base 2,000. W/V 190/10. Vis : 10 miles.	
500		No low cloud. W/V 120/05. Vis : 20 miles.	
900		3/8 Cumulus, base 2,000. W/V 060/10. Vis : 10 miles.	
1,000		As above.	
500	NW	7/8 Strato-Cumulus, base 6,000. W/V 210/20. Vis : 5 miles.	Part of first record day (see text).
500	E	4/8 Cumulus, base 2,000. W/V 310/10. Vis : 10 miles.	
600		7/8 Cumulus, base 2,500. W/V 160/10. Vis : 6 miles.	See "Remarks" under "House Martin."
700		8/8 Stratus, base 1,800. W/V 230/20. Vis : 5 miles.	
700		6/8 Stratus, base 1,200. W/V 270/10. Vis : 4 miles.	
700		No low cloud. Hazy. W/V Variable, light. Vis : 7 miles.	Height of ground : 1,500.
1,000		No low cloud. W/V 300/10. Vis : 10 miles.	
600			
400		No low cloud. W/V Variable, light. Vis : 20 miles.	
600		4/8 Cumulus, base 4,000. W/V 310/12. Vis : 10 miles.	



TABLE I—DETAILS OF OBSERVATIONS, OCTOBER 1954–OCTOBER 1956—(continued)

Species	No.	Date	Local time	Place
Swift (continued)	1	17.6.56	1320	10 miles W of Rome, Italy.
	1	25.6.56	1330	Feltham, Middlesex.
	3	26.6.56	1512	2 miles E of Biarritz, France.
	1	"	1654	2 miles NNE " " "
	2	"	1655	4 " " " " "
	1	"	2015	Teddington, Middlesex.
	1	12.7.56	1245	Aberdeen.
	1	15.7.56	1025	Wahnerheide, Germany.
	1	16.7.56	1620	London Airport, Hounslow, Middlesex.
Skylark ( <i>Alauda arvensis</i> )	1	26.3.55	0829	10 miles NNE of Hamburg, Germany.
Swallow ( <i>Hirundo rustica</i> )	3	5.4.55	1045	Havelsee, 8 miles W of Berlin, Germany.
	1	2.10.56	1540	Manchester Airport, Ringway, Cheshire.
House Martin ( <i>Delichon urbica</i> )	1	18.9.56	1230	London Airport, Hounslow, Middlesex.
Crow sp. ( <i>Corvus</i> sp.)	3	26.3.55	0827	14 miles NNE of Hamburg, Germany.
Carrion Crow ( <i>Corvus corone</i> )	1	30.3.56	1048	30 miles WSW of Warburg, Germany.
Rook ( <i>Corvus frugilegus</i> )	12	30.3.56	0752	Havelsee, 8 miles W of Berlin, Germany.
	15	"	0935	8 miles SE of Cologne, Germany.
	14	"	1205	Brandenburg, Germany.
Finch/bunting (Fringillidae)	3	5.4.55	1210	6 miles NW of Wittenberge, Germany.
Unidentified	1	8.5.55	1143	Chesham, Bucks.

Height and heading (indicated height in feet ; heading not always known)	Weather (cloud heights in feet ; wind direction in degrees from true north and speed in knots)	Remarks
2,400 W	No low cloud. W/V 240/10. Vis : 10 miles.	
1,200	No low cloud. W/V 300/10. Vis : 8 miles.	
800	No low cloud. W/V 340/08. Vis : 7 miles.	
1,400		
1,600		
900	No low cloud. W/V 290/15. Vis : 15 miles.	
1,900	No low cloud. W/V 120/05. Vis : 20 miles.	
800		Height of ground : 250.
800	7/8 Strato-cumulus, base 3,500. Calm. Vis : 4 miles.	
1,500 Circling	7/8 Strato-cumulus, base 6,000. W/V 210/20. Vis : 5 miles.	Part of first record day (see text).
2,300	No low cloud in immediate vicinity. W/V 270/10. Vis : 2 miles. Temp : 8°C. (46.4°F.).	Extensive low Stratus over N. German plain, being 8/8 ten miles to E. with tops at 1,500. A ridge of high pressure lay from Finland to France, with a weak warm front over W. Germany.
1,000	4/8 Stratus, base 1,500. 8/8 Strato-cumulus, base 2,500. Vis : 5 miles.	
600	7/8 Cumulus, base 2,500. W/V 160/10. Vis : 6 miles.	This bird was near the Black-headed Gulls. On the previous day at Beddington Sewage Farm, Surrey, I had watched large numbers of the same two species wheeling around in moderate thermals to a great height in similar weather.
1,600 NNW	7/8 Strato-cumulus, base 6,000. W/V 210/20. Vis : 5 miles.	Part of first record day (see text).
3,100	See " Rook " below.	Height of ground : 2,000. Part of second record day (see text).
2,900	No low cloud. 7/8 Cirro-stratus above. W/V 180/15. Vis : 10 miles.	
2,700		Part of second record day (see text).
2,500		
2,500 N	8/8 Stratus, tops 2,000. 8/8 Nimbo-stratus, base 4,000. Vis : 3 miles. W/V 300/10.	For further weather see " Swallow " of same date above. Pale brown bird : undulating flight.
1,500	6/8 Cumulus, base 3,000. W/V 230/20.	Bird passed too close to aircraft for identification.

varying continually in relation to terrain clearance. The objection to quoting height above sea-level is obvious. However, all my observations refer to birds a clear 500 feet above the ground; further all except five (where the height of the ground is given) are at least four times the height of the ground immediately below them—indeed they average ten times the height.

#### DISCUSSION

The number of observations made while at cruising height remains very low. The 792 flights upon which the observations are based, have been made at cruising heights as set out below: the number of flights is followed in each case by the number of observations that have occurred in the height-group commencing at that height and up to but not including the following height.

500'	1000'	1500'	2000'	2500'	3000'	3500'	4000'	4500'	5000'
11-23	21-9	22-19	26-4	22-4	13-3	44-2	36-0	44-0	65-1
5500'	6000'	6500'	7000'	7500'	8000'	8500'	9000'	9500'	10000'
49-0	52-0	57-0	49-0	62-0	67-0	50-0	49-0	19-0	19-0

There were also 4 flights at 10,500', 3 at 11,000', 3 at 12,000', 2 at 12,500', 2 at 16,000' and 1 at 18,500', all without observations.

The preponderance of birds in the three lowest levels is again most marked, many of these occurring during climb or descent and not while cruising at these low altitudes. Cruising heights are very similar to those referred to previously, although data were then available for 100 flights only, and not, as now, for the entire period under review.

Table II shows the same data expressed as percentages in three height-groups, revealing a slight tendency towards higher cruising than formerly quoted, with an even greater preponderance of birds in the lowest height-group.

TABLE II—PERCENTAGES OF BIRD OBSERVATIONS AT DIFFERENT CRUISING HEIGHTS

Height	% of flights cruising therein	% of total bird observations
Below 2,000'	7	78
2,000'-4,000'	23	20
Above 4,000'	70	2
	<hr/> 100	<hr/> 100

The monthly distribution of observations, together with the total hours of daylight flying in each month over the two-year period, is set out in Table III. Taken on their own, to the extent that so few figures can reveal any trend, the observations show three peaks, namely March-April, June-July and a lesser one in September. March and April are the only months to show numbers of birds obviously on passage, few autumn migratory and no hard weather movements having been seen.



TABLE III—MONTHLY DISTRIBUTION OF OBSERVATIONS AND DAYLIGHT FLYING

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Observations	0	0	18	15	6	10	12	0	3	1	0	0
Number of hours flying by daylight	35	32	54	114	107	128	175	125	105	79	36	52
Calculated Incidence	2.2	2.0	3.4	7.1	6.7	8.0	10.9	7.8	6.6	4.9	2.2	3.2

Also included in Table III is the calculated incidence of observation which would have occurred had the number of observations been evenly distributed throughout the hours of daylight flying. If the differences between the actual and calculated number of observations are examined, and differences of 3.25 (or 5% of the total) or less are ignored, then of the three apparent peaks above only March-April survives as abnormal. June and July give results roughly in proportion to the volume of flying, while the peak of September is shown, together with August and October, as a "trough".

The bulk of observations fall between the hours of 0730 to 1800 (all times local time) with five or more observations each for the following half-hour periods:— 0800-0830; 1200-1230; 1600-1630; 1630-1700. Isolated cases are reported to me of birds being struck at night, but I have not yet flown into any. Though night-flying forms roughly 50% of all flying over the four winter months of November to February, my only night record is of a possible Redwing (*Turdus musicus*) seen only some 200-300 feet above the ground as it crossed the beam of my landing lights just before I landed at Paris at 2345 hours on 10th October 1956.

The two observations on Swallows fall at each end of their summer visit and alone might suggest high flying on migration. However, as this species has occurred over all the area of all my flights since 1944, the very large number of negative reports suggest that this is unlikely. I saw Swallows 24 hours before the Berlin observation, on passage at Hanover (same latitude), and also at Manchester, on the same day as the airborne observation there. Thus other Swallows were in these latitudes at the times concerned.

Nine days yielded two observations each and four yielded three or more. These four are covered by the four more detailed analyses which follow.

#### WEATHER

Observations have occurred in a great variety of weather conditions. The cloud cover for the 63 observations where the weather has been noted are given in Table IV and reveal that:—

98% of birds observed had the ground in sight some or all of the time.

49% of birds observed had the sun in sight most of the time.

TABLE IV—CLOUD-COVER AT TIME OF OBSERVATION

No cloud	Bird below 4/8 or less cloud	Bird below more than 4/8 cloud	Bird above adjacent cloud	Bird between 8/8 layers of cloud	Total
22	7	31	2	1	= 63
35%	11%	49%	3%	2%	= 100

As most single birds and flocks of small birds are detected only when within 200 feet vertically of the aircraft, birds should be seen with equal readiness in any cloud-condition except when either bird or aircraft is flying immediately above, or below, or within cloud. It is unlikely that birds, any more than aircraft, would seek to fly, other than temporarily, just within or adjacent to cloud. Several disadvantages would arise, including turbulence, precipitation and lack of forward visibility. Sustained flight by birds within cloud is even less likely. Thus, cloudiness will only reduce observations in direct proportion to the time spent in cloud by the aircraft. As this loss applies equally to unseen birds above or below cloud, it does not affect the assumption that flight by birds out of sight of the ground is no more common—taken as a percentage of the whole—than the published data suggest. That the present observations are too small a sample to be reliable, is suggested by the fact that in only one out of 63 observations were the birds over  $3/4$  or more cloud layer, whereas in my earlier paper no less than six out of 51, where the weather was noted, were over  $3/4$  or more cloud.

#### HERRING GULL

Seventeen observations refer to this species, almost all being near the coast or close inshore. Only one refers to a bird more than fifteen miles from land (North of Alderney), while the furthest inland was over Finchley, Middlesex. There is no obvious co-ordination between on- or off-shore breezes and the observations. The monthly distribution of these 17 is of interest: ten fall in April and six in July, while the bird North of Alderney was again unusual, being in September. Previous observations were more widespread in their monthly distribution, though again April had most.

Geographically, twelve of the seventeen were in Scotland and I am reasonably convinced that records for this species, and probably to a lesser extent for three or four other species of gull, could be added to on Scottish coastal regions on many days with little difficulty.

It is of note that the only one seen well out over the sea, like the two previously recorded, was within twenty-five miles of the Cap de la Hague, and like them in autumn with W.N.W. winds.

#### SWIFT

This species accounts for 16 of the present series of 65 observations, including the highest and the second highest. All fall between mid-May and Mid-July, regardless of their wide geographical

distribution. From ground-observations made at Rome on the previous day, I was surprised not to see more birds other than the solitary one when I flew from there on 17th June 1956. They were apparently spending much time aloft at considerable heights, as indeed they seem to, throughout their brief season there.

All observations have occurred below cloud or on cloudless days.

26TH MARCH 1955

On a flight from Copenhagen to Hamburg, my co-pilot first noticed some birds as we commenced our gradual descent from 4,000 feet. Shortly after, at 0812 local time, at 3,500 feet we passed 20 Lapwings and then at 0823, while 23 miles N.E. of Hamburg and at 1,500 feet, we passed a further 40. In the ensuing nine minutes eight observations covering six species occurred at intervals of roughly one minute. The last was of Black-headed Gulls at only 300 feet and is accordingly not included in Table I. This remarkable spate of nine eligible records in 19 minutes, or 12% of all observations to that date, occurred in conditions of only poor to moderate visibility of approximately five miles, below a cover of 7/8 strato-cumulus cloud and in a S.S.W. wind of 20 knots. A depression which had earlier been over south Scotland had moved steadily east and at 0830 (local time) was centred just north of the area concerned. An associated warm front had just moved northwards up the route. Conditions generally were very mild after a recent cold spell, snow still lying in sheltered positions at Hamburg where the surface temperature rose rapidly from 48°F. at 0700 to 57°F. at 0800 (local time) with the passage of the front. With such a wealth of activity being noted in such unfavourable conditions for observation, one can but hazard a guess at the total movement involved.

30TH MARCH 1956

This day bears some resemblance to the preceding one in so far as time of year and geographical location of observations. On this occasion, however, seven observations were spread over as many hours and over the entire route from Berlin to Cologne and back. Weather-conditions were better with about ten miles visibility and only a thin veil of very high cirro-stratus cloud above. A weak trough of low pressure extending N.E. from a depression over Spain gave rise to southerly winds of 15 knots. Observations were restricted to the two families of crows (*Corvus* sp.) and buzzards (*Buteo* sp.).

Wintering Rough-legged Buzzards (*B. lagopus*) seen at Langenhagen airfield, Hanover, have a typically pale plumage which I think would be detected from an aircraft, were the birds seen referable to this and not to the Common species (*B. buteo*). All air-observations have been of apparently dark birds.

It is of note that on each of the previous years when I have been flying between Berlin and the cities of West Germany during the latter half of March, I have recorded species of either or both the



above genera. There is no other area I visit, where migration has been noted with such regularity.

#### CONCLUSION

The present observations show many similarities to the previous series, including the general paucity of birds above the 500-foot layer and their marked scarcity above 2,000 feet. However, observations occurred once every 16 hours of flying by daylight: this is a big improvement on the once in every seventy previously recorded, and a marked, though less remarkable improvement, on the incidence since December 1952 to the end of the previous period, of one observation per 24 hours day-flying. December 1952, it may be recalled, marked the main change of my routes from predominantly the Irish Sea area to routes covering much of western Europe.

The present series has been heavily augmented by the four boom factors mentioned, two being ascribed to presumed favourable weather and two to the soaring propensities of the species concerned.

North Germany alone emerges as a relatively prolific area.

#### SUMMARY

1. Observations covering the two-year period October 1954 to October 1956 are given.
2. These are discussed in relation to height, seasonal and diurnal variation, and cloudiness.
3. Two days and two species are considered separately.
4. The incidence of observation has increased due to certain factors which are noted.

#### NOTES

**Early sexual maturity of a female Mallard.**—On 6th November 1956, a female Mallard (*Anas platyrhynchos*) wearing a British Museum ring (941642) was recaptured in the decoy at Slimbridge, Gloucestershire. She was accompanied by four ducklings, estimated to be four or five days old. This female was marked at Slimbridge on 4th September 1956, when Mr. Peter Scott, who caught the bird, recorded it as a juvenile female. In deciding its age, he used the presence of some juvenile tail-feathers, with notched tips, as the principal criterion. The age at which young Mallard shed these feathers is subject to some individual variation, but, at least at Slimbridge, they are rarely retained later than about eighteen weeks after hatching. This suggests that 941642 is unlikely to have been hatched before the beginning of May 1956, so that she became a mother at scarcely six months old and must

have begun laying eggs less than five months after being hatched.

Several other female Mallard appeared with broods in early November. None of these other females could be caught, so that they offer no additional proof of early maturity, but the possibility that late autumn broods, which occur quite frequently in this species, are produced by early-maturing females rather than by females that had bred or attempted to breed earlier in the year is perhaps worthy of note.

Though 941642 and her offspring have evaded capture since 6th November, it should be recorded that all four ducklings survived to fly in early January, although nearly all the other November broods were total failures. HUGH BOYD

**Quail swimming.**—At mid-day on 29th April 1952, while I was at sea *en route* to Malta from Athens (position: 36° 23' N., 19° 38' E.), a Quail (*Coturnix coturnix*) that had been found on board ship was brought to me. The bird had made no attempt at escape when picked up, but it was uninjured, though apparently very tired. Allowed to rest undisturbed for thirty minutes, it recovered and when placed in a sheltered spot remained for a while before taking wing. It flew some 200 yards close to the water, then turned into the wind to alight on the sea, and I watched it riding the slight swell buoyantly, wings above the water, head turning to watch the passing of another vessel, until the distance became too great. I had previously observed a number of Passerines coming to grief and was struck by this bird's complete absence of signs of distress throughout the observation-period of several minutes. That the Pheasant (*Phasianus colchicus*) will swim if necessary is well known, but this appears to be the first recorded instance of a Quail doing so. J. A. BAILEY

**Oystercatcher and Dunlin nesting near Manchester.**—Mr. F. R. Horrocks has informed me that near Astley, between Leigh and Worsley, Lancashire, 6 to 7 miles from the centre of Manchester, both Oystercatcher (*Haematopus ostralegus*) and Dunlin (*Calidris alpina*) nested in the flat plain, four miles north of the River Mersey, in the summer of 1956. A pair of Oystercatchers came to a colliery flash on 5th May. Then a nest and eggs were found in a cultivated field on 16th May, half a mile from the flash, but the eggs later proved to be addled, probably because of disturbance during farming operations. The Dunlin's nest with four eggs was found on 6th June in a patch of dry grass near the flash and the bird was sitting on 11th June, but it also seems to have failed for on the 20th neither eggs nor young could be found.

There is one other record of the Oystercatcher's nesting in the south Lancashire plain (*antea*, vol. xli, p. 30), within a few yards of the Mersey, 3 miles east of Warrington. The nest in 1956, however, shows an advance rather farther east and away

from the river. The Dunlin nests in the Lancashire Pennines and has done so occasionally near Southport on the Lancashire coast (C. Oakes, 1953, *The Birds of Lancashire*), but there is only one other record of its nesting in the Mersey valley and this was on a tidal river-side marsh near Widnes (A. Jackson in *Zoologist*, 1906) over half a century ago. A. W. BOYD

**Dowitcher in Co. Wexford, Ireland.**—On 29th September 1956, we came across a wader feeding in company with Redshanks (*Tringa totanus*) on the open muddy shore of a channel on the North Slob, Co. Wexford, which we identified as a Dowitcher (*Limnodromus griseus*). The bird was watched through binoculars in a good light at a range of 20-25 yards and the following details were noted:—

The immediately noticeable features were the long, dark, thick bill, and the prominent pale eye-stripe and hoary cheeks. The upper-parts were greenish-brown-grey, not markedly patterned. The breast was suffused with buff and the rest of the under-parts were white. Legs olive-yellow. Size about that of the Redshanks near-by, but a little more robust. In flight a very marked long strip of white extending well up the centre of the back and a thin pale trailing edge to the wing were noticeable. The tail was slightly wedge-shaped, the feet protruding slightly. The flight-action and shape were markedly like those of a Snipe (*Capella gallinago*).

No call was heard although the bird was disturbed several times. It was once seen to be aggressive towards the Redshanks. This forms the third recorded occurrence of this species in Ireland and the first since 1893.

H. ENNION, ROBERT F. RUTLEDGE and T. J. UNDERWOOD

**Upland Sandpiper in Co. Wexford, Ireland.**—The light was failing on 29th September 1956, when T.J.U. noted a wader-like bird running fast in a dry grass field on the North Slob, Co. Wexford. At first it was thought to have a superficial resemblance to a Reeve (*Philomachus pugnax*), but as we watched it we became aware of a remarkably noticeable thinness of the neck. The small head appeared as if "stuck" on to this very attenuated neck. H.E. is particularly well acquainted with the Reeve and was sure that it was not one. While on the ground the bird appeared uniformly brown, but showed light markings on the head. The bill was dark and short. The bird frequently bobbed in the fashion of a Redshank (*Tringa totanus*). In flight, an indistinct pale area, rather similar to that of a Knot (*Calidris canutus*), was just perceptible on the wings; otherwise the bird appeared featureless and any idea that it could have been a Reeve was dispelled when no white ovals on the tail were seen. On two occasions the bird uttered in flight a mellow, liquid, double note rendered as "plüt plüt" (H.E.) or "chwut chwut" (R.F.R.)—very distinctive. Eventually the bird alighted in a dry field and we were unable to find it again.



On the following day T.J.U. returned to the area and was fortunate in locating the wader in a large dry grass field. He made the following notes while it fed undisturbed at quite close range:—

Buff stripe above eye. White throat and under tail-coverts. Feathers of the breast and belly off-white, each feather being edged with white giving a general slightly barred effect. Legs dull yellow and about Redshank length. Apparently a slight white edging to the outer tail-feathers, and the tail-feathers seemed pale-tipped. Very thin neck again particularly striking. Call like "two small bubbles bursting in quick succession".

Reference to description in *The Handbook* and elsewhere confirmed our identification of the bird as an Upland Sandpiper (*Bartramia longicauda*). We did not observe the barring on the under-wing which is generally given as a character of this species, but we were not looking for this feature and in any case it would have been almost impossible to see since the bird flew directly away from us at no great height. The last Upland Sandpiper to be recorded in Ireland occurred about 1901 and the present forms the fourth known instance.

H. ENNION, ROBERT F. RUTTLEDGE and T. J. UNDERWOOD

**The unusual death of a late Glaucous Gull in Shetland.**—On the afternoon of 13th May 1954, I was surprised to see a Glaucous Gull (*Larus hyperboreus*) in full breeding-plumage on the foot-hills of the island of Foula in Shetland. The bird appeared weak and was slow on the wing. It allowed a close approach and I noticed that the wings appeared fully as long as the tail; but the bird was identified by its heavy bill and head. It flew off slowly along the side of the hill.

On the evening of 15th May the bird was brought to my house by Mrs. Gear of the Schoolhouse who had found it exhausted on the hills. It was very weak and spent much of its time opening and closing its bill as though choking. In Foula dialect, it appeared to have "the gapes". It was offered fish, but refused and made vicious attempts to peck when it was handled. After it had been kept overnight an attempt was made to feed it, but it was unable to swallow fish placed in its gullet and shortly afterwards it died.

Glaucous Gulls in good health have been seen later in the year than this, as for instance in 1950 (*cf.*, *antea*, vol. xliii, pp. 409-413), but this late bird was interesting for two reasons—the cause of its delayed return was unusual; and I was able to examine its plumage and compare it with the normal winter adults seen in this country. Firstly, the bird had died of starvation, but the reason for this was not clear until I dissected the bird for skinning. A large sea-urchin, still almost intact, was stuck in the bird's oesophagus with the spines facing downwards. The stomach and alimentary canal were completely empty and the lack of

subcutaneous fat on the carcase showed that the bird had starved for some considerable time. In the stomach were the remains of fish-bones and the shell of a crab's claw which showed that the bird had been unable to eject the indigestible remains of its last feed as well as being unable to swallow any more. Although the bird was in perfect adult plumage, only one of the testes was even discernible and that was poorly developed.

Secondly, the bird confirmed the contention of Mr. G. T. Kay (*antea*, vol. xl, pp. 369-373) that the wings of the full-grown adult in breeding plumage usually project beyond the tail, as in the Iceland Gull (*Larus glaucoides*), and do not provide a reliable means of separating the two species in the field. This bird was an adult male with a wing-spread from tip to tip of 57 inches, and when it was sitting its wings reached just beyond its tail, although the tail measured 225 mm. which is much longer than the longest measurement given in *The Handbook*. The 2nd primary was longest with the 3rd nearly equal to it. The eye-ring was yellow, but not very bright probably as a result of the bird's weak condition. The skin was preserved and is now in the Royal Scottish Museum in Edinburgh.

C. K. MYLNE

**A feeding-method of Black-headed Gull.**—On the morning of 12th January 1957, at Ham Island Sewage Farm, Old Windsor, Berkshire, an adult Black-headed Gull (*Larus ridibundus*) was observed feeding in a manner to which there seems to be no reference in *The Handbook*, though it may be a development of the "trampling on wet mud or sand" there mentioned.

The bird was partially hovering over, and partially "treading water" in, very soft "mud" (sewage sediment). At first it gave the impression of being held fast by the mud, but was seen to fly on about a yard and repeat the actions. The feet were paddled below the surface and food was taken from the surface, presumably disturbed by their action.

J. H. FLINT and I. M. WALKER

**Swallows feeding on torpid flies.**—A recent note (*antea*, pp. 76-77) on this subject prompts me to record a similar occurrence which I witnessed near Stansted Mountfitchet, Essex, at about 2030 hours on 22nd July 1954. I was visiting the local sewage farm and spent some time watching a flock of ca. 100 adult and immature Swallows (*Hirundo rustica*), which was present in the farm area. My attention had been first attracted to the birds by their abnormal behaviour. Many were settling on the profuse low vegetation (2 to 3 feet high) covering several of the sewage-beds, while about them others flew low overhead. When I moved closer, I realized that they were feeding on a host of small black flies emerging from and clinging to the tangled weeds. The birds which settled on plants did not perch for long, but nearby on the road by the sewage farm, which was also covered with flies, several birds fed continually for some 2 to 3 minutes without leaving the ground.

The afternoon and evening of the 22nd was dull and overcast in the Stansted area, but the temperature was quite high. At the time I considered this behaviour rather as a readily-taken opportunity than as an unusual method of feeding (due to lack of food resulting from inclement weather), which is the explanation offered in the previous note on this subject. D. I. M. WALLACE

**Brown-and-white Willow Warbler breeding in Ross-shire.—**

From 9th to 14th June 1956, I was staying with Captain H. C. Ranald, R.N., and Mrs. Ranald at Evanton, Ross-shire. On my arrival, my host told me that, a few days previously, he had noticed in his garden a small warbler which he identified from T. A. Coward's *The Birds of the British Isles* as a Siberian Chiffchaff (*Phylloscopus collybita tristis*). Next day I noticed a very white leaf-warbler flitting about the steep grassy slope below the house and above the river; and on the subsequent days we watched it at very close quarters, again and again, for in fact it was brooding eggs in a nest in the bank, and when it left the nest it normally flitted into some small broom and other bushes within a few yards of where we stood to watch it. When I first saw it, I agreed that it looked just like a Siberian Chiffchaff in colour, but its legs were pale brown. Its mate, which appeared to be a typical Willow Warbler (*Ph. t. trochilus*) rarely appeared and hardly ever sang; so I had some difficulty in persuading my hosts that the white bird was not a Chiffchaff.

It showed no trace of yellow in its under-parts, which were, indeed, almost pure white, slightly grey on the sides. Its upper-parts were a fairly warm brown, without a trace of green or yellow. There was a faintest trace of yellow at the edge of the wing-coverts. In other words, it had the plumage of typical *Ph. t. yakutensis*, which breeds from Perm eastwards through East Siberia. Ticehurst points out, however, in *A Systematic Review of the Genus Phylloscopus* (1938, pp. 27-29) that throughout N.E. Europe and N.W. Asia, two types of Willow Warbler occur, breeding side by side, the one type brighter than *t. trochilus*, the other as brown and white as *yakutensis*. As far as I know, the brown-and-white type has not hitherto been recorded breeding from Britain or from any other part of the range of typical *trochilus*. It is perhaps worth while putting this incident on record, partly as a warning against hasty identifications of the eastern races of *Phylloscopus* spp. in this country. It is possible, of course, that this Ross-shire bird was in fact from the range of *Ph. t. evermanni* (= *acredula*), where the two forms occur side by side; for there have been records of such brown-and-white specimens occurring in Britain on migration. It seems more probable, however, that from time to time, even in the range of typical *trochilus*, a variant occurs with as little yellow as the most easterly *yakutensis*. The whole species is, as Ticehurst observes after examining over a thousand skins, highly variable. The



same conclusion can be reached, I think, by observing scores of individuals in the English country-side; but the English country-side very rarely produces one that suggests a Siberian Chiffchaff.

H. G. ALEXANDER

## REVIEWS

THE BIRD WATCHER'S REFERENCE BOOK. By MICHAEL LISTER. (*Phoenix House*, London, 1956). 256 pages. 45s.

It is curious that *The Bird Watcher's Reference Book* should have appeared at about the same time as *The Ornithologists' Guide* (see *antea*, vol. xlix, pp. 504-505). Both have developed independently from the same unusual idea of providing a background of information of value to the practical bird watcher who wishes to make some contribution to his subject, and it is remarkable that the approach of each book is so different. The first part of this reference book is ecological in outlook. The author deals with habitats, and factors which affect the growth and distribution of the main types of British vegetation; there is guidance on identification (a number of trees and grasses are sketched), methods of keeping records of vegetation are given, and a list of ornithological habitat-types is included. The importance of the weather is becoming more widely recognised; directions are given on the interpretation of a weather map, and a number of meteorological principles are explained.

A feature which cannot fail to receive favourable mention here is a chapter giving advice on points to be watched in writing a paper. A large part of the book is devoted to a glossary, giving general information on a great number of ornithological terms together with their equivalents in German, Dutch and French. There is also a directory which covers some 650 bird-periodicals published all over the world, and information on about 70 bird-observatories and ringing schemes.

The book is thus designed to be a work of reference in which every bird-watcher may expect to find something useful to him. In his introduction the author states that his object has been to provide, in a single volume, a convenient source of reference and practical help on a few of the "background" subjects which impinge on real bird-watching at so many points, subjects on which a bird-watcher often requires to know a little but on which so often he cannot obtain adequate information without going to a great deal of trouble. Mr. Lister may justifiably claim to have been successful in his purpose.

P.A.D.H.

THEY TELL OF BIRDS. By THOMAS P. HARRISON. (*University of Texas Press*, Austin, 1956). xviii + 159 pages, 1 coloured plate and 12 other illustrations. \$3.

TO-DAY, when so many ornithological man-hours are passed in recording rarities or noting the most trivial details of birds' lives,

there is a fairly general ignorance of the history of ornithology, and thus Professor Harrison's book in which he studies the treatment of birds in the works of four English poets (Chaucer, Spenser, Milton and Drayton) comes as a refreshing change. But the author does not confine himself to poetry: in an introductory chapter (perhaps the most interesting part of the book) he describes the allegorical and mythical properties which the writers of the Middle Ages, largely under the influence of Isidore of Seville, attributed to living creatures. Then there was "a learned tradition in which the visible phenomena in nature were of no account; in fact, to the visible world the mass of traditional data bore little or no resemblance". This tradition gradually gave way before the more scientific attitude of the Renaissance, and it is against this background that Professor Harrison's study is set. "With differences", he says, "Chaucer, Spenser and Milton adhered to the notion that birds exist as symbols of good and evil. Though Chaucer . . . was closest to the objective attitude of later centuries". Only Drayton fully shows the Renaissance attitude, although he lived earlier than Milton; his "triumph lies in the revelation that poetry is capable of serving a new end in objective and intimate descriptions of bird life".

Professor Harrison is an expert on ornithological tradition; he also knows his English birds well and has taken pains to become acquainted with them in the field. The book is not only packed with fascinating factual knowledge, but is a pleasure to read.

M.F.M.M.

## LETTERS

### THE COLLECTION OF RECORDS FOR ANALYSIS

SIRS,—Your correspondent, Mr. T. C. Smout, raises issues of fundamental importance (*antea*, vol. xlix, pp. 287-288). If a paper is put forward for publication in a scientific form and purporting to have some scientific value, the author or authors should be prepared to abide by the canons of scientific behaviour. In particular, when the data available to the authors are known to be or are strongly suspected of being incomplete, they must either state so in their publication and be prepared for their conclusions to be upset by more complete data or withhold publication until they have obtained most, if not all, of the necessary facts on which their conclusions are to be based. This is particularly true of work on problems relating to migration where considerable inferences are often made on comparatively few data.

There are two main courses of action open to the worker who is unable to obtain all the data he requires within a given time. One is to wait, as suggested above, for there is "no justification for the publication of hasty or slipshod work or for flooding the literature with trivia" (Mayr *et al.*, 1953). The other is to publish, but, because of the lack of complete data, the treatment should be very brief and the conclusions few (or none) and conditional.

Future workers would, however, be able to base little reliance on either data or conclusions. The first alternative is thus much the best; the value of the work would be enhanced and there would be less frequent publication. In either case valuable space, now wasted, would be conserved.

An exception to the above conclusions occurs when a long-term survey is carried out; e.g. a population study of a given area over a number of years or an analysis of the migration patterns of a species during each year. In such cases it is usually of value to publish a record of the first year's work in concise form, with few tentative conclusions and with indications of future work, and then publish a full and detailed report after five or ten years or when the study is completed. "As a general rule, material that belongs together should be published together, and in the final analysis the author is judged not by the number but by the quality of his publications" (Mayr *et al.*). Lengthy tabular data that would accrue as a result of a prolonged study could be represented in the publication with greater clarity by graphs and diagrams and, as suggested by the Editors of *British Birds*, could be deposited at the Edward Grey Institute.

The final word as to whether or not a publication is printed rests with the editors concerned. The author must, however, bear the responsibility. It is in the interests of both to collaborate as far as is possible. Where the report is based on observations of a periodic nature the advantages of a full long-term analysis must be carefully balanced against any others that may accrue from early publication. Author-editor collaboration may help to determine which procedure is the most advisable in individual cases.

When analysis has to be based on data collected by many widespread observers, Mr. Smout's plea for full co-operation between the author and the editors of the local reports is worthy of the fullest support. It cannot be denied that these men receive the most complete collection of available records though, through being overburdened, it may be some time before they can assess and catalogue them. It would be advisable and laudable to obtain a uniform and simple system of filing these records so that they may be readily available and, too, uniform criteria for the acceptance or rejection of records. These matters are, however, primarily the duties of the editors concerned though we should all be ready to assist if needs be.

Finally, I can strongly recommend the references given below to any who wish for guidance on the publication of their observations.

JOHN ROBBINS

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- TRELEASE, S. F. (1951): *The Scientific Paper. How to Prepare it. How to Write it*. Williams & Wilkins, Baltimore.



## HOUSE SPARROWS IN THE DESERT

SIRS,—A. W. Boyd's short addendum (*antea*, vol. xlix, p. 512) to D. Summers-Smith's interesting paper on the House Sparrow (*Passer domesticus*) (*ibid*, pp. 465-488) draws attention to the occurrence of these hardy birds in desert regions. I have seen occasional House Sparrows in desert or semi-desert localities of North Africa, the Middle East, Australia, California and Mexico. Although nearly all the occurrences were related either directly or indirectly to the presence or influence of man, some suggested an astonishing adaptability to abnormal circumstances. One can readily understand the process by which *P. d. niloticus* penetrated the Sinai Desert by following the food supply provided by the cavalry and mule trains during the 1914-18 war. I have seen Spanish Sparrows (*P. hispaniolensis*) following the camel caravans in the same manner on the stony Moroccan deserts and thus doubtless extending their range to distant oases and native villages. But sometimes House Sparrows seem to appear from nowhere in the unlikeliest places, far from their normal habitat.

I remember my astonishment in finding one of these birds (probably *P. d. niloticus*) drinking from the leaking radiator of my staff-car at a halt during a journey from Alexandria to El Alamein in 1944. Unfortunately I do not recall how far I was at the time from the nearest habitation, but it was probably 15 to 20 miles and there was no vegetation in sight. Those who have travelled in the desert know, of course, how readily small birds will drop down from the sky to shelter from the sun beneath stationary vehicles. I assume that is what this bird had done. I was told later that "sparrows" had been seen around bivouacs and temporary camps along the coastal desert route into Libya and that they followed the armies of both sides back and forth during the long campaign. This cannot be accepted as evidence and I was not in the theatre long enough to verify it, but I hope A. W. Boyd's note may produce some first-hand information. It seems difficult to credit that House Sparrows would follow completely mechanized armies as a source of food far into completely barren desert, but these birds were certainly present in small numbers around some of the camps and depots in the rear area of the Eighth Army. Their occurrence could not be explained by the presence of horses, mules or camels, except perhaps by the chance visits of Arab nomads.

In 1941 I visited an American army installation in the Mojave Desert in California, which at the height of summer is one of the hottest spots in the United States. At that time there used to be a small café and petrol-station far out on the desert road, where motorists were glad to stop for a cold drink and a snack. A signpost warned that it was 40 miles to the next garage. A few tattered eucalyptus and Joshua trees provided a little shade for the parked cars. As I stopped, three or four House Sparrows descended from the trees and began greedily picking the

accumulation of butterfly and other insect corpses from the almost red-hot radiator grid of my ear. In the picturesque language of the café-proprietor "the little critters suddenly appeared a few years back and quickly discovered how to make an easy living off the parked automobiles and by pan-handling for crumbs". Sure enough, when I came out ten minutes later a small group of House Sparrows waited expectantly by the clean-picked front of my car for me to give them the remains of my sandwich.

These instances seem to suggest that House Sparrows can occasionally, perhaps by accident, successfully cross considerable barriers of completely alien habitat, thanks to their unusual capacity for adaptation to the slenderest opportunities for survival. Without such a capacity a normally sedentary species would not have succeeded in extending its range and numbers throughout a great part of the world in such a dramatic manner.

GUY MOUNTFORT

#### RINGING IN EGYPT

SIRS,—I would be most grateful if anyone who has records of ringing and retrapping at the Fayid trapping station in Egypt between 4th June 1952 and 1956 would lend them to me for copying, at Hou Cottage, Alderton, Woodbridge, Suffolk.

H. G. BROWNLOW

#### SIGHT RECOVERIES OF MARKED OYSTERCATCHERS

SIRS,—In recent months I have marked a number of Oystercatchers (*Haematopus ostralegus*) with red or green dye on rump or secondaries. I should be most grateful if anyone who sees one of these birds would write to me at New College, Oxford, and let me know when and where he saw it.

E. J. M. BUXTON

#### THE DISTURBANCE OF THE OSPREYS IN SCOTLAND

SIRS,—In view of the possible misinterpretation of Mr. P. W. Sandeman's criticism (*antea*, p. 148) of the placing of a microphone at the nest of a pair of Ospreys (*Pandion haliaëtus*) in Speyside, I would like to point out that the B.B.C.'s Natural History Recording Unit was in no way associated with this event.

ERIC SIMMS

PURCHASED  
3 JUL 1957



## NOTICE TO CONTRIBUTORS

*British Birds* publishes material dealing with original observations on the birds of Britain and Western Europe, or where appropriate, on birds of this area as observed in other parts of their range. Except for records of rarities, Papers and Notes are normally accepted only on condition that the material is not being offered to any other journal. Photographs (glossy prints showing good contrast) and sketches are welcomed. Proofs of all contributions accepted are sent to authors before publication. After publication 20 separates of Papers are sent free to authors; additional copies, for which a charge is made, can be provided if ordered when the proofs are returned.

Contributors are asked to observe the following points, attention to which saves the waste of much editorial time on trivial alterations:

1. Papers should be typewritten with double spacing, and on one side of the sheet only. Shorter contributions, if not typed, must be clearly written and with similar spacing. Failure to help in this way may result in delays to publication.

2. Notes should be worded as concisely as possible, and drawn up in the form in which they will be printed, with signature in block capitals and the writer's address clearly written on the same sheet. If more than one Note is submitted, each should be on a separate sheet, with signature and address repeated. In the case of rarity records, any supporting description which is too detailed for publication should be attached separately.

3. Certain conventions of style and lay-out are essential to preserve the uniformity of any publication. Authors of Papers in particular, especially of those containing Systematic Lists, Reference Lists, Tables, etc., should consult the ones in this issue as a guide to general presentation. English names of species should have capital initials for each word, except after a hyphen (e.g. Siberian Thrush, Yellow-headed Wagtail), but group terms should not (e.g. thrushes, wagtails). English names are those used in *The Handbook of British Birds*, with the exception of the changes listed in *British Birds* in 1953 (vol. xlvii, pp. 2-3). The scientific name of each species should be given (in brackets and underlined) immediately after the first mention of the English name. Sub-specific names should not be used except where they are relevant to the discussion. It is sometimes more convenient to list scientific names in an appendix. Dates should take the form "1st January 1955" and no other, except in Tables where they may be abbreviated to "1st Jan.", "Jan. 1st", or even "Jan. 1", whichever most suits the lay-out of the Table concerned. It is particularly requested that authors should pay attention to Reference Lists, which otherwise cause much unnecessary work. These should take the following form:

TUCKER, B. W. (1949): "Species and subspecies: a review for general ornithologists". *Brit. Birds*, xlii: 129-134.

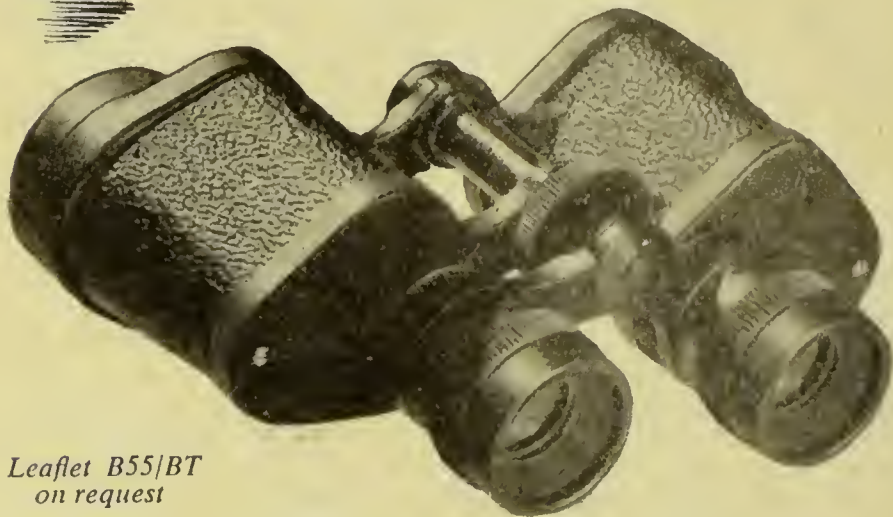
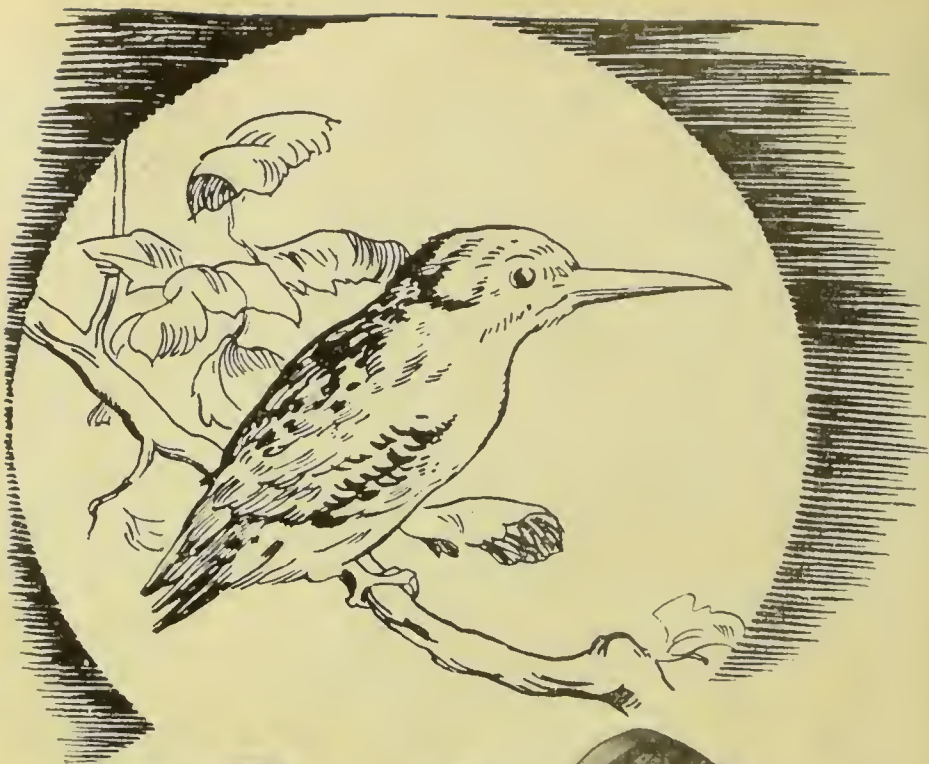
WITHERBY, H. F. (1894): *Forest Birds: Their Haunts and Habits*. London. p. 34.

Various other conventions concerning references, including their use in the text, should be noted by consulting previous examples.

4. Tables should be numbered with Roman numerals, and the title typed above in the style used in this issue. The title and any headings within the Table should not be underlined, because this sometimes makes it difficult for the Editor to indicate the type to be used. It is most important that the lay-out of each Table should be carefully planned with an eye to its final appearance; above all, it should be borne in mind that Tables must either fit into the width of a page, or be designed to fit a whole page lengthways. All Tables should be self-explanatory.

5. Figures should be numbered with Arabic numerals, and the captions typed on a separate sheet. All line-drawings should be in Indian ink on good quality drawing paper (not of an absorbent nature) or, where necessary, on graph paper, but this must be light blue or very pale grey. It is best if maps, graphs, etc., are drawn twice the size of the final reproduction (ideally, therefore, for the normal 4" width the original should be 8" wide); sketches of birds, however, should be only slightly larger than the size at which it is intended they should appear. It is always most important to consider how each drawing will fit into the page. The neat insertion of lettering, numbers, arrows, etc., is perhaps the most difficult part of Indian ink drawing and, unless he has had considerable experience of this kind of work, an author should seek the aid of a skilled draughtsman. The publishers regret that, owing to rising costs, it will in future be only in exceptional cases that they can undertake to have lettering inserted.





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# BRITISH BIRDS



AUGUST 1957

THREE SHILLINGS



# BRITISH BIRDS

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Edited by

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## CONTENTS OF VOLUME L, NUMBER 8, AUGUST 1957

	PAGE
Editorial	313
The "invasion" type of bird migration. By Dr. Gunnar Svårdson	314
The moult migration of the Shelduck from Cheshire in 1956. By R. H. Allen and G. Rutter	344

### Notes:—

Black-headed Gulls feeding on hawthorn berries (Eric Gorton)	347
Fieldfare in Kent in June (James J. M. Flegg)	347
Crossbills feeding on grain in gull-pellets (Dr. E. L. Arnold and J. C. S. Ellis)	347
Melanistic Ringed Plover in Kent (P. E. Beard, Bruce Coleman and Edward Jones; Bryan L. Sage)	347
Roller in Co. Wexford (Major Robert F. Ruttledge)	348
Black Stork in Worcestershire (R. J. Bradney)	348
Blue-winged Teal in Gloucestershire (M. Davy; Hugh Boyd)	349
The identification of Baird's and Semi-palmated Sandpipers (Kenneth Williamson and H. G. Alexander)	350
Feeding association between Coot and Little Grebe (John N. Hobbs)	351
Montagu's Harrier pellet containing whole egg (Bernard King and Dr. K. B. Rooke)	352
Meat skewer swallowed by Herring Gull chick (J. M. Harrop)	352
Lapwing apparently with brood of seven (R. M. Band)	352
Yellow Wagtail wintering in Surrey (B. S. Milne)	353
Magpie robbing Kestrel (Bryan L. Sage)	353

### Reviews:—

<i>The Wildfowl Trust: Eighth Annual Report, 1954-56.</i> Edited by Peter Scott and Hugh Boyd	353
<i>A Population Study of Penguins.</i> By L. E. Richdale	357
<i>The Ring.</i> Edited by Dr. W. Rydzewski	358
<i>Wildfowl of the British Isles.</i> By Peter Scott and Hugh Boyd	358
<i>The Hawfinch.</i> By Guy Mountfort	360

Cover photograph by Harold R. Lowes: Black-headed Gull (*Larus ridibundus*) on nest



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## BRITISH BIRDS

### EDITORIAL

MANY KIND THINGS have been written in the Press about the fiftieth anniversary of the first publication of *British Birds*, including a leading article in *The Times*, an editorial in *The Field* and appreciative notes in *Country Life*, the *Observer* and the *Sunday Times*. Birthday wishes were also sent over the air by the B.B.C.

We are all the more grateful for these and other appreciations because in the nature of things the Editors, Publishers and printers are accustomed to receive more criticism for their real or supposed failures than praise for their achievements. Nevertheless, our readers may be assured that we are still some way from succumbing to complacency, and in this we are ably assisted by our candid critics, especially when they point to faults of which we are only too well aware.

One of these is the *Sussex Bird Report* for 1956 which complains that some of the more unusual county records have been in our hands for over a year without decisions to accept or reject having been notified, and that consequently it has been necessary to devote a good deal of space to descriptions which are redundant if they are afterwards to be repeated in *British Birds*. There is much justice in this reproach, and we are making special efforts to overcome these delays. At the same time we feel bound to call attention to some of the factors responsible for them which it is in the power of some of our readers to remedy.

Recently there has been a tremendous increase in the number of records of rarities sent forward for publication, in the number of observers concerned, and in the number of ornithologists who have to handle these records editorially. At the same time there has been a great and successful effort to raise standards of discrimination against incorrect or doubtful records and to ensure the fullest consultation and co-ordination before records are published. We have sought to meet this flood of material by concentrating on the more critical identifications and on those of the utmost rarity while



relying increasingly on the capable and experienced editors of local reports to sift and adjudicate the great mass of less unusual records and those requiring special local knowledge. Unfortunately, despite the great efforts and achievements of many editors of local reports, the residue of unsifted and unsatisfactory records coming directly to the Editors of *British Birds* is still unmanageably voluminous.

The causes of this are varied. Some editors appear to mistrust their own powers to the extent of referring to us many records which they might reasonably be expected to settle for themselves according to perfectly familiar and straightforward principles. Too many parts of Britain are still not covered by any local report and for these we are to some extent compelled to step into the breach until local ornithologists can undertake the editing and publication of their own local records. Too many ornithologists add unnecessarily to the burden by sending forward records in a form entailing considerable correspondence in order to elicit necessary information which should have been included in the original account. If our task could be narrowed to considering only records which we should properly consider, submitted always in satisfactory detail, it would be manageable, but it would still be burdensome. We ask, in the interests of all, for further co-operation towards this end. It will not be easy, but rare efforts must be expected of those who would be credited with having seen rare birds.

## THE "INVASION" TYPE OF BIRD MIGRATION

By GUNNAR SVÄRDSON

### INTRODUCTION

FOOD-SHORTAGE is generally assumed to be involved in those emigrations that are called "irruptions" or "invasions" (these terms of course, being applied in the areas into which the birds come). What it seemed most urgent to explain, therefore, was why the birds leave their home-range in some years but not in others.

Previous discussions have been concentrated on the stimuli that could be involved in the release of the actual irruption flight. A supposed shortage of food—or, alternatively, overpopulation by the birds—has been looked upon as the releasing stimulus. Both could be combined to mean the supply of food per individual bird, or the amount of food obtainable per unit of effort.

Laek, in a recent discussion (1954), placed the food-shortage, whether absolute or relative, as an ultimate factor, while the proximate factor, releasing the actual flight, was supposed to be a high number of birds.

In this way Lack tried to explain why some of the better-known irruption-species, viz. Crossbills\*, Great Spotted Woodpeckers or Nutcrackers, begin their movement so early that food-shortage cannot yet have appeared. Lack found some support in the fact that, before large-scale invasions into Continental Europe, the Scandinavian breeding-populations of the invading species have been observed to be dense. In later sections of this paper, however, another explanation of this fact will appear.

Reinikainen (1937) discussed the normal correlation between the crop of spruce-cones and the number of breeding Crossbills in the Fenno-Scandian forests. He also stressed that the whole population of Crossbills is rather mobile after breeding and that invasions into cone-rich areas occur during the summer. This is, in fact, the general experience of Scandinavian ornithologists. Formosof (1933) pointed out that Siberian Nutcrackers also begin to move after being fledged in July.

It seems, therefore, most simple to suggest that the irruption-species start a flight every year, stimulated by the same factors as the ordinary migrants. The duration and length, however, of this flight is very variable in different years. When the flight is short the birds tend to stay within their normal breeding-range and, accordingly, no irruption or invasion (in the normal use of these words) occurs in such years.. In other years, the flight is not brought to a standstill; the birds continue and are recorded as performing an irruption or invasion.

Instead of asking ourselves why the birds start flying, it may in future be more constructive to ask: why do they stop flying in some years, to become sedentary? If they stop only when they have met with abundant food, there will often be an observable food-shortage within the "home range" of the invading birds, i.e. in the region they have just passed.

#### THE SEASONAL PASSAGE OF SISKINS AND WHITE WAGTAILS AT OTTENBY

Outside Fenno-Scandia it may not be widely known that hundreds of Swedish ornithologists have for some years co-operated at two famous bird-localities, counting all birds passing during the whole day. These observations have been most continuous at Ottenby, situated at the very south point of the Isle of Öland in the Baltic (see Fig. 1). Thanks to the extreme concentration of the passing birds, which follow the shore or the narrow strip of land (Svårdson, 1953), it has been possible to count almost every one, during all hours of the day, every day and for several consecutive seasons. This extremely time-consuming job was discontinued at Ottenby in the late autumn of 1956, when ten whole seasons had been ornithologically mapped. The task of analysing the enormous amount of material has yet to be begun.

\*Scientific names of all bird-species discussed in the text are given in an Appendix on page 340.



FIG. 1.—MAP OF SCANDINAVIA, TO SHOW POSITIONS OF PLACE-NAMES MENTIONED IN THE TEXT

From the Ottenby diaries it is possible to divide the passage of Siskins into half-monthly periods, and so to study the fluctuations in the dates of passage in a pronounced invasion species. For comparison an ordinary migrant, which passes at the same season, has been selected, i.e. the White Wagtail. The data are found in Tables I and II.



TABLE I—PASSAGE OF SISKINS (*Carduelis spinus*) AT OTTENBY, SWEDEN, 1947-1955

Year	Birch-seed index	Percentage of season's total during					Season's total
		August 16th-31st	September 1st-15th 16th-30th		October 1st-15th 16th-31st		
1955	1.1	—	31	49	13	7	4,019
1949	1.5	3	30	37	25	5	9,752
1947	2.0	—	2	16	75	7	2,685
1952	2.0	—	—	34	52	14	4,311
1953	2.0	—	—	76	18	6	6,541
1951	2.2	—	1	37	46	16	1,233
1950	2.5	—	—	14	75	11	730
1954	2.9	—	—	3	66	31	1,030
1948	3.1	—	1	8	23	68	3,980

TABLE II—PASSAGE OF WHITE WAGTAILS (*Motacilla alba*) AT OTTENBY, SWEDEN, 1947-1955

Year	Percentage of season's total during						Season's total
	August 21st-31st	September			October		
		1st-10th	11th-20th	21st-30th	1st-10th	11th-31st	
1951	7	41	32	18	2	—	41,927
1950	6	31	35	22	6	—	36,396
1949	10	26	41	22	1	—	34,503
1952	5	38	34	21	2	—	28,327
1955	1	23	31	33	11	1	20,281
1948	5	37	43	11	4	—	20,121
1947	1	2	83	13	1	—	17,037
1954	8	16	29	42	5	—	9,659
1953	5	16	47	26	6	—	7,418

From the publications of the Institute of Experimental Forestry the fructification of birch (*Betula*) is recorded, averaged for the whole of Sweden (for details see a later section) and included in Table I. The seeds of birch and alder (*Alnus*) are the main autumn food for the Siskins. Since no information is available on the food-supply of the White Wagtails, their number was assumed to indicate the food pressure on the individual bird (Table II).

It is seen from the Tables that there is a striking difference between the invading species (Siskin), and the ordinary migrant (White Wagtail). Both display strong numerical fluctuations in their passage-populations, but differ as regards stability of the passage-period. The Siskins pass much earlier in some years than in others. When their food is very scarce, as in 1949 and 1955, roughly a third of the population has gone by the middle of September, but in years of abundant food, as in 1948 and 1954, the first third of the population has not passed until the middle of October. Thus the bulk of Siskin-passage may vary by at least one full month. The White Wagtails, on the contrary, display very small variations in their period of passage. Five times out of nine, the peak passage was in the middle ten-day period of September.

As was observed by Haartman and Bergman (1943), Grenquist (1947), Rudebeck (1950) and Svårdson (1953), the same weather-stimulus acts on invaders as on normal migrants. This was extremely evident in the Siskin passage of 1955, when, as a result

of the poor food-supply, the birds on the whole were early. In August and the first days of September, however, the weather was very warm, and no birds arrived. But when a cyclone came after a long period of anticyclonic weather, the colder air behind it caused an avalanche of Siskins at Ottenby on 9th-10th September. In two days a thousand Siskins passed, which was a quarter of the year's total. Before that only two had been seen, on 25th August.

In his review of Waxwing irruptions, Siivonen (1941) found that only the smaller flights were correlated with the food-supply. His arguments, as well as Härm's observations of Waxwings passing some local rich supplies of Rowan (*Sorbus*) berries in Dorpat, Estonia, in autumn 1931 (Schüz, 1933), have often been cited. Also, Lack (1954) is inclined to think that the invading species sometimes turn out to be "migrants", which in this case means that they overshoot regions rich in food. This unfortunately completely misses the essential character of the invading species, which is just their tendency to stay or delay further flight when they meet with a rich food-supply. As they also react to the weather stimulus, however, they might pass over locally good food-resources, when a cold air mass has just released their urge to fly.

Siivonen's results are weakened by the fact that he compares the strength of Waxwing invasions in Hungary with the fructification of the Rowan in Finland, though some invasions may have started in Russia or Siberia.

In the autumn of 1913, moreover, the Rowan, according to data available to Siivonen, had a rich crop of berries in Finland. At the same time a widespread Waxwing invasion occurred in Europe. In the foregoing winter, however, Montell (1917) found Waxwings abundant in Finnish Lapland, a result of the rich fruiting of the Rowan in the autumn of 1912. Therefore, since two good years never follow immediately after each other, Siivonen's data are probably not correct as regards northern Finland.

Summing up, there is strong evidence that invading species discontinue their flight when they meet with abundant food. On the other hand, if abundant food is not found, the wandering is continued until death.

#### THE SISKIN INVASION OF 1949

In an analysis of results from ringing in Belgium, Verheyen (1956) found the passage of Siskins in 1949 exceptional. Instead of wintering in Belgium or northern France, the birds of this great irruption passed through these countries, and ringed ones were recorded in southern France and Spain. This has a parallel in the records of Ottenby Bird Observatory. Of the exceptional number of Siskins passing there in 1949, some 500 were ringed and five of them were recorded in the following winter in Italy,

France and Spain. The movement of Siskins in 1949 is thus similar to the greater irruptions of the Waxwings, which are built up by huge numbers of birds, start early and extend far south of the normal winter-range.

Verheyen thought the invading Siskins of 1949 came from Ural or some other eastern region. But in the spring of 1949 the breeding population of Siskins was exceptional in Sweden and therefore the birds were probably Scandinavian. It is often difficult to prove a population peak of a species which breeds regularly, but the Siskins were so numerous in 1949 that this was spontaneously reported by many ornithologists. Larsson (1952) found the Siskin abundantly breeding in south-western Sweden, near the town of Skara, in 1949. He thought they had two broods as nests were found from the latter half of April to the middle of June. They appeared in the locality (Helås) together with Redpolls which wintered. The winter was rich in spruce seeds and the autumn of 1948 also rich in other sorts of seeds (*cf.* Table I).

Large flocks of Siskins and Redpolls also wintered during 1948-1949 at the town of Borås (Rösiö, 1952) and Siskins bred there in 1949 when Crossbills were also numerous in the rich cone-supply of the forests.

In most years, Siskins do not breed in northernmost Sweden, but in 1949 the population of breeding Siskins was huge in these regions also. Blomgren (1951) found the year to be a peak one at Harads, not very far from the town of Luleå, and Brännström (1952) located some nests in the parish of Arvidsjaur, Lapland, where the birds normally do not breed.

It is well known that Siskins, as well as some other birds of the forest region of northern Sweden, have peak years when they breed much further to the north. The spring of 1949 was then such a peak year for Siskins, though 1935 may have been still better. Both springs were rich in spruce-seeds.

The rise of the population is very sudden and not due to propagation. Instead, immigration is very clearly the explanation of the peak. This immigration starts during the previous autumn, when birds are accumulating in the forests, rich in food. Therefore, the immigration in the autumn of 1948 was the ultimate cause of the high breeding-population of the spring of 1949. After breeding this population made a movement southwards in the autumn of 1949, appearing as an "irruption" in the southern part of their potential winter range, i.e. France and Spain.

Since an accumulation of Siskins in Sweden cannot occur unless birds come from the east (few breed in Norway), we must seek the explanation in an irruption of Siskins from the east.

We now begin to see how the system works in practice. The invading birds move mainly westwards (or eastwards) over their potential breeding-range, being gradually absorbed by those regions in which food is most abundant. They may or may not leave this region for a period in winter, returning in spring to



breed in the region located in autumn. After breeding a new search for the next year's breeding area begins.

Verheyen may be right, when he suggests that the Siskins originated from Ural. If so, however, they arrived in Scandinavia in 1948, the year in which no invasion was noted in Sweden, though the number of Siskins (and Redpolls!) was rather high at Ottenby (Svårdson, 1949, 1950). The birds which invaded Belgium in 1949 were probably Scandinavian, and mostly Swedish. Their concentration in western Europe may have been caused by the Atlantic coast functioning as a guiding-line. We are now faced with a new problem: why did not the Siskins of 1949 start for a return flight eastwards, into the vast regions of spruce forests of Russia? We will meet this problem again related to some other invasions of recent years.

#### THE WAXWING AND REDPOLL INVASIONS OF 1931

There was a wide-spread irruption of Waxwings in Europe in the autumn of 1931 (Stresemann, 1932; Schüz, 1933; Tischler, 1941; Witherby *et al.*, 1938). It was also noticed in Denmark (Kjaer, 1932; Løppenthin, 1932) and in southern Sweden (Behm and Lönnberg, 1931). Even in the middle of October Waxwings were observed in central and southern Sweden. This was about six weeks earlier than is normal and their numbers were much larger than usual. Redpolls invaded northern Germany at the same time (Stresemann, 1932; Bährmann, 1932; Tischler, 1941). Both irruptions started from northern Fenno-Scandia and it is now possible to reconstruct their earlier history.

The Redpolls appeared in vast numbers in eastern Finland in October 1930. In Karelia, especially in the vicinity of Joensuu, they increased until in February 1931 they were reported almost everywhere (Pynnönen, 1934). In spring most of them disappeared from Joensuu, but some remained and bred, which is a remarkably far southern locality. Along the whole south coast of Finland, however, vast numbers of Redpolls appeared in April, from Helsinki to the Russian frontier, and later they spread to Wasa further to the north. In the latter half of April they began to disappear from southern Finland (Qvarnström, 1931) and for a short spell in the same month they also appeared in masses on the Swedish side of the Baltic, in the province of Hälsingland (Witt-Strömer, 1931).

Since there was a bad cone-winter in the spruce-forests no Redpolls were reported as breeding in southern Finland or middle Sweden, apart from Karelia. The Redpolls must have travelled farther north for breeding and this was verified by the reports from Stuart Baker and Hortling to Qvarnström (1931) that Redpolls bred numerously in the arctic part of Fenno-Scandia in the summer of 1931. Breeding of the E. Scandinavian race *C. f. holboellii* was proved, as also of the Arctic Redpoll. Nests of the latter species were found in 1931 in Petsamo by Merikallio (1934).

It is interesting that one specimen of *C. f. holboelli* was shot by Bährmann (1932) on 24th November 1931 in the province of Brandenburg in Germany. It fell from a flock of the invading Redpolls.

The evidence about the Waxwing is equally convincing. In the winter of 1930-31 Fenno-Scandia was invaded by a huge wave of Waxwings, arriving from the east. Rowan berries were extremely abundant over all the region, as was stressed in a number of published reports about the Waxwings. This abundant supply of food led to wintering in northern Fenno-Scandia by almost all the Waxwings! Their scarcity was commented upon from southern localities.

Large flocks of Waxwings appeared near Helsinki on 16th January 1931 (Hortling, 1931). At Wasa in Finland they did not arrive until the second week in February (Tegengren, 1931). On the Swedish side of the Baltic, they appeared in February-March at Luleå and remained there for the rest of the winter (Holm, 1935). In Jämtland, almost in central Sweden, the Waxwings also wintered, which has happened only once before (Nilsson, 1944). Everywhere they fed on the Rowan berries, which were so numerous that the Waxwings could eat them the whole winter. Normally the supply is soon exhausted.

Siivonen (1941) says the abundant Waxwing breeding in northern Finland and Sweden in the summer of 1931 was the result of a normal population increase. It is true that this sudden rise of the population is normal both for the Waxwing and other invading species, but it is by no means a gradual increase due to natural propagation. On the contrary, we know that the abundant breeding of 1931 was due to the fact that the invading and wintering Waxwings remained to nest. It is known that the Waxwing in spring also feeds on frozen berries from the previous autumn, notably berries of Crowberry (*Empetrum*), Bearberry (*Arctostaphylos*) and Cowberry (*Vaccinium*) (Finnila, 1914). No data exist on the abundance of these berries in 1930, but they often follow the Rowan.

Nilsson has described the breeding in some detail for Näliden in Jämtland, where in his long experience Waxwings have bred only in 1931. In April of that year flocks of 10-20 Waxwings were observed flying around in the forests, but though this was Nilsson's first observation of Waxwings in spring since the beginning of the century, he did not realize at first that they would remain and breed. But in May and June the birds were still there, and finally he located several pairs and found four nests (Nilsson, 1944). The same process was no doubt going on over vast areas. Along the Swedish coast of the northern-most Baltic, where normally no Waxwings nest, the birds bred abundantly in the summer 1931, even on small isles off the coast (Holm, 1935). Nests were found also in Pajala, in the forest region (Lönnerberg, 1931).

Thus, the irruptions of Waxwings and Redpolls in the autumn of 1931 into the regions south and south-west of Fenno-Scandia were made by the abundant breeders of the summer of 1931. These, however, had arrived from the east in the late autumn of 1930.

The Waxwings returned to Fenno-Scandia to breed abundantly also in the summer of 1932 (Holm, 1935) and an "echo-flight" was observed in Europe in the winter of 1932-33 (Schüz, 1934). This second invasion was for the most part weaker than the first, except in Norway (Løvenskiold, 1947) and Hungary (Schüz). Anyhow, in the spring of 1933 the survivors must have flown to the east, as hardly any breeding was reported in Fenno-Scandia during 1933-1936.

#### THE CROSSBILL INVASION OF 1942

In 1942 Crossbills started a large-scale irruption westwards from a region east and north-east of Germany (Drost and Schüz, 1942). Reports from the German soldiers in Russia showed that the movement was observed as far east as the River Volchow on the southern shore of Lake Ladoga (Hornberger, 1943). Crossbills were also observed in Schleswig-Holstein (Emeis, 1942) and in the Netherlands (Bos *et al.*, 1943), and they arrived in great numbers in the British Isles.

The movement was in full swing from the latter half of May and gradually died down in late summer, as is usual with the Crossbills. At that time they had accumulated in those areas where the fructification of spruce was good. This was the case in almost the whole of central Europe as well as in parts of Finno-Scandia (Sweden). The wooded mountains of Thüringer Wald as well as Schwarzwald had a fine Crossbill winter. In 1943, breeding was proved abundantly in Germany and also in Denmark (Hornberger, 1943).

In Sweden the cone-crop of the spruce was excellent over the whole country. It was the best crop since the winter of 1931-32 and was rivalled later only by the winter of 1954-55. As regards Crossbills, however, the winter of 1942-43 was probably the richest in Sweden for a really long time, due to the rare combination of fine cone-crop *and* a great invasion from the east. In 1931-32 the Crossbills were in fact few (Rosenberg, 1935) and in 1954-55 they were only moderately numerous. The correlation found by Reinikainen (1937) therefore is not always so positive as indicated by his material.

The summer-invasion of 1942 was noted in Sweden at Falsterbo (Rudebeck, 1943) and Hälssleholm (Linder, 1942), in Ärtemark in western Sweden (Karvik, 1942) and many flocks headed west at Jokkmokk in Lapland (Bollvik, 1943). Nests were found in February-March 1943 at Harads near Luleå (Blomgren, 1944); the Crossbills were abundant near Boden (Herner, 1944) and they appeared in the province of Norrbotten in "enormous numbers"



(Holm, 1945). Ten nests were found at Lit in Jämtland in a small area (2 acres) of young spruce (Jonsson, 1949), 2 nests were located near Ljusdal (Witt-Strömer, 1950) and 4 nests were found near St. Tuna in the province of Dalarna (Frendin, 1943); Crossbills had their "richest season of breeding" at Ekshärad, Värmland (Hannerz, 1945), were numerous in Nydala, further south in Småland (Jakobson, 1945) and were often observed at Perstorp, northern Scania (Lilja, 1946). Several Crossbills nested near Copenhagen (Nielsen, 1943), the species occurred in "masses" at Jaegerspris, northern Sjaelland (Holstein, 1954), and many bred in Jutland in the conifer plantations (Poulsen, 1947).

There was also an earlier, but smaller, invasion in the summer and autumn of 1941 (Rudebeck, 1948). Some Crossbills bred in Sweden and Denmark in the spring of 1942, but further east the population seems to have been more dense, i.e. near Alakurtti, north-eastern Finland ( $67^{\circ}\text{N}$ ,  $30^{\circ}\text{E}$ ) (Franz, 1942), at the south end of the great Lake Onega (Perttula, 1944) as well as along the River Svir (Syväri) between Lake Onega and Lake Ladoga (Klockars, 1944). The area of emigration for the 1942-invasion thus seems to have been confined to eastern Fenno-Scandia and north-western Russia, possibly also the central part of the European part of Russia.

In May 1943, after the abundant breeding from northern Sweden to southern Germany there was an exceptionally dense population of Crossbills in this western fringe of their enormous potential breeding area (Fig. 2). And what happened to them? They all returned back, eastwards! No observations of east-flying Crossbills in 1943 were published in Sweden, but in Germany, with its better guiding lines for birds flying east, things were different. Hornberger (1943) reported east-going flocks from February on, though most were later, in May, June and July, i.e. the normal annual movement-time for Crossbills. In Hanover, Mark, Rhineland and Ostpommern, birds were seen flying north-east or east. In East Prussia movement was intense from the start in February to the peak in June. On 11th June 1943 no less than 3,460 Crossbills were counted flying north-east over the Frische Nehrung, a narrow strip of sand some distance from the Baltic shore. Also, farther inland, many more were seen in Losgehnien between 22nd April and 26th June than ever before in spring time (Hornberger, 1943).

In the late summer and autumn of 1943 all were gone from Sweden and the woods were emptied not only of Crossbills but also of cones. There was hardly any flowering of the spruce in the spring of 1943.

#### THE FIELDFARE INVASION OF 1937

Every third or fourth winter Scandinavia is invaded by huge masses of Fieldfares, which in some cases remain to breed in the following spring. In the winter of 1936-37 such an invasion



FIG. 2.—THE BREEDING-DISTRIBUTION OF THE CROSSBILL (*Loxia c. curvirostra*)  
 Drawn after Dementiev and Gladkov (1954), but modified in Europe according to the spontaneous occurrence of  
 Norway Spruce (*Picea abies*).

appeared, but it came exceptionally late. Due no doubt to the weather, a number of other bird species were also late and great "hard-weather movements" of migrants occurred at Heligoland during January 1937 (Drost, 1937).

From 28th January onwards thousands of Fieldfares appeared at Stockholm and other localities in the vicinity. Lönnberg (1937) was interested in their obvious eastern origin and asked ornithologists living in the north for information. Mr. Sune Hederström reported from Bjuröklubb, some 40 kilometres S.E. of Skellefteå on the Bothnian coast, that at least a thousand Fieldfares appeared there on 26th January. Later they flooded the town of Skellefteå and there were estimated to be "several tens of thousands". From the town of Umeå Mr. O. Holm reported large flocks of Fieldfares during the very first days of February. They were accompanied by Waxwings and both species fed on the Rowan berries, of which there was a fine crop.

This invasion had some extraordinary consequences, which were not realized until Salomonsen (1951) announced the immigration and breeding of the Fieldfare in Greenland. The reconstruction by Salomonsen, however, that the immigration followed a flight from south Norway "in the afternoon of 19 Jan. 1937" downwind to Jan Mayen and Ymer Island on N.E. Greenland seems rather improbable to the present writer. The birds recorded on 20th January probably belonged to a different wave from those recorded flying southwards in western Greenland during 27th-31st January. There is a week between the two sets of records and, moreover, the birds that were drifted to Ymer Island on the east coast of Greenland would have had to survive the week in a very severe environment. Death seems more likely to have been the fate of the birds of 20th January.

There is, however, a suggestive coincidence in the appearance of the huge masses of Fieldfares in Sweden and in western Greenland. They first occurred on 26th January in north-eastern Sweden, on 27th January on the west coast of Greenland and on 28th January at Stockholm, further south in Sweden. If they had started somewhere on the Taimyr peninsula in Siberia the distance would have been the same to Godthåbsfjord in Greenland as to Stockholm in Sweden! The distance is of the same magnitude as a transatlantic flight, which is known to be performed by some birds. The darkness of the arctic region during January may have stimulated the birds to continue flying for an exceptional distance.

The same agent that caused the sudden "winter-flights" of various birds during January 1937 may have had something to do also with the situation that led to a drift of Russian or Siberian Fieldfares out over the Arctic Ocean. There was no exceptional strength to the gale which Salomonsen thought to be responsible for driving the Fieldfares across the Atlantic Ocean. Fieldfares are probably on the move off the Norwegian coast almost every winter and the gales are there too. But the Fieldfare was new to



the Nearctic fauna in 1937 and this stresses the remarkable nature of the events that led to the transatlantic colonization.

A further spread of the Fieldfare in the Nearctic seems very probable.

#### BREEDING AFTER INVASIONS AND THE DIRECTION OF FLIGHT

Invasions are often followed by breeding in the invaded area. This fact has been stressed by Kalela (1949) but otherwise this significant trait is often neglected in the literature. Also the dominant westerly trend is a characteristic of an invasion movement, which adds to the principal differences between invasion and ordinary migration.

In order to give further evidence of these traits, some other recorded invasions may be surveyed shortly.

The Two-barred Crossbill invades Scandinavia from Russia or Siberia in some years, chiefly during the larger movements of Crossbills. Their western trend is so pronounced that up to 1940 (Tischler, 1941) only two records were known for East Prussia. The second was in 1930, when again the species was much more abundant in Fenno-Scandia. Hortling (1931b) saw the largest flock, one of 40, but flocks were observed in that year by many ornithologists in Finland, Sweden, Norway and Denmark.

The post-invasion breeding is not related to the size of the movement but to the fructification of spruce seeds. If the crop is bad, Two-barred Crossbills do not remain in Scandinavia at all, but continue—and are almost certainly lost over the Atlantic. In other years, as in 1903, 1914 and 1926, nesting was proved after winters rich in cones.

The Siberian Nutcracker often has a marked westerly course. In the movement of 1931 many Nutcrackers were observed in Finland (Hortling, 1931a) and Sweden (Lönnerberg, 1931b), but comparatively few passed through East Prussia (Tischler, 1941). As these Nutcrackers never meet with their main food, the seeds of the Arolla Pine (*Pinus cembra*), they hardly ever stop and the invasions become real death-wanderings. After the 1911 movement, however, nesting was proved in 1912 in Denmark (Jespersen, 1913) and during the 1954 movement two of these birds were fed by the lighthouse-keepers on the isle of Gotska Sandön in the Baltic. They bred in June 1955 and appeared with their young at the feeding-place (Lundberg, 1955).

The Russian or Siberian subspecies *biedermanni* of the Nuthatch has made some westerly invasions over Finland and into northernmost Sweden, especially in the winter of 1900-01 and again in 1951-52. Breeding occurred in the spring of 1952 at Junosuando (67° 30'N.) in Sweden after regular feeding at a "bird-table" (Svärdson, 1955a).

The Long-tailed Tit also invades Sweden from the east in some autumns. After some of these wanderings, the breeding population is greatly increased, as in the years 1925, 1930 and 1935

(Svårdson, 1935; Durango, 1941). It is not known what kind of food is involved in this case.

Roughly every third or fourth autumn the Bullfinch is also on the move. Its population peaks have not been recorded in Sweden, but in Denmark the subspecies *pyrrhula* was formerly known only as a winter-visitor. In the winter of 1933-34 many were observed at Jaegerspris, Sjaelland; they remained in the spring and Holstein (1935) could report at least nine pairs breeding. This certainly was due to a rich supply of spruce seeds, as the Siskins, which had been abundant winter-visitors too, also remained and bred (Holstein, 1934).

There was a big influx of Great Spotted Woodpeckers in central Europe in the late summer of 1929. In the alpine region there was an exceptionally rich crop of spruce-seeds in the spring of 1930 (Geyr von Schweppenburg, 1930). The participants of the 1929 movement which happened to find this area of rich food remained to breed. This was followed by a second invasion of young birds in August 1930 in Italy (Duse, 1932) which had not been visited in the movement of 1929. To take an example from the opposite limit of distribution of this species: after the great 1909 movement the Great Spotted Woodpecker bred in 1910 in Sør-Varanger in northernmost Norway at 70°N. (Løvenskiold, 1947).

That the rodent-eating birds—owls, some raptors, skuas and shrikes—behave in just the same manner is better known. Their power of locating an area rich in food and gathering there—also for breeding—is commented upon in many books (cf. Hagen, 1952). Both the predators and the vegetarian birds therefore have one important stimulus in common: a rich supply of food depresses their mobility and releases a sedentary habit.

The direction of flight is often mainly west. But as most ornithologists live on the western fringe of the land-masses of the Old World, their opinion of the general direction of invasions is sometimes influenced by guiding-line effects on the birds. The Crossbill irruption of 1953 probably originated in the central part of European Russia, as Bubnov (1956) reported exceptionally abundant Crossbills during the winter of 1952-53 in the district of Kostroma, some 200 miles N.E. of Moscow (58°N., 41°E.). Their main direction of movement was therefore westerly. In several irruptions Crossbills ringed on Heligoland or Fair Isle later turned sharply off and were found in Italy. In this way a wrong opinion of the standard direction of the birds could easily occur. Schaanning (1948) demonstrated the strong western preference of the ringed Fieldfares from Scandinavia which were later found in France. They had taken a trip over the British Isles before reaching their wintering area, south-westwards from Scandinavia.

Obviously, however, invasions cannot always have a westerly course. We have already met with eastern movements of Waxwings (in 1933) and of Crossbills (in 1943) back into the vast

taiga zone of Russia. Some ornithologists (Svante Wendel, Harry Lundin) have kindly reported summer observations of Crossbills leaving the Swedish Baltic coast to fly eastwards, and in Finland a concentrated east-going movement of Crossbills was observed near Tavastehus, Finland on 2nd and 3rd July 1948 (Nuorteva, 1952). Johansen (1944) found some vagrant Parrot Crossbills at Novosibirsk in 1935, a year of great westerly movements of Crossbills in Europe. He says that either there are isolated, unknown colonies of Parrot Crossbills in Siberia, or one is prompted to suggest that invasions from Europe may reach Siberia in certain years.

As already pointed out, most ornithologists live on the western fringe of the great Eurasian land-mass and they would, of course, observe only invasions to the west. The east-going movements—which one deduces occur more frequently than has actually been shown—could be observed only by Russian ornithologists.

#### INVASION AS AN ADAPTATION

“Well-developed homing behaviour is a necessary concomitant of territorial behaviour and hence shares the advantages of the latter—even spreading of the population, assurance of food supply, segregation during courtship, etc. Intraspecific competition is reduced by the avoidance of what might seem to be a natural tendency to settle in the first favourable area encountered on migration. Indeed, without homing all regular migration would break down.”—(Matthews, 1955).

Intraspecific competition is no less in the winter-quarters and hence natural selection tends to make allopatric populations allohiemic, i.e. they have different winter-ranges (Salomonsen, 1955). The habit of homing both to the summer- and to the winter-areas tends to break up many bird populations into smaller, elementary populations (Isakov, cited by Salomonsen).

There is one important supposition, however, in this evolutionary thinking about the direction of natural selection. If birds return to their last breeding- or winter-area only to find it less rich in food than other areas, they are not favoured by natural selection. Those individuals on the contrary, which performed a less precise homing but could locate areas rich in food and remained there, would in fact be the most probable survivors.

It follows that ordinary migration, with its homing and seasonal stability, is an adaptation to a *seasonal* food shortage, while the *annual* differences between the food-supply of corresponding seasons are slight and insignificant from an evolutionary point of view.

Invasion is, on the contrary, an adaptation to annual differences between seasons. In its most developed form, in the Crossbills, the whole population moves once a year, in summer, from one breeding-area to the next. The shift is performed during those months in which there is a natural minimum of spruce seeds in the



cones, as the new crop begins to ripen in August. At that time the new breeding-area is normally found.

Invasion tendencies are differently evolved in different species, according to the average food variations. The Siskin has to move in such a way as to meet seasonal as well as annual food differences. It behaves in autumn more or less like a migrant, but has a varying winter-range and a very varying breeding-range.

The Brambling has evolved the capacity of locating areas of rich crops of beechmast in winter. It is mainly known as a winter invader into different parts of Europe. Its invasion tendencies in summer are much less evolved, because of its insect diet at this time of the year. Nevertheless, it has repeatedly bred south of its range, and cold springs have been put forward as the cause. As suggested by Kalela (1949), however, these southern breeding records come after winter invasions, which are probably more responsible than any cold weather.

In many species of birds there is a delicate balance of three selective forces, that which results in ordinary migration, that which leads to invasion and finally that which results in completely sedentary habits. Related species may behave differently and, moreover, subspecies may differ, as in the Nuthatch. Northern subspecies may often be more irruptive than southern ones, as is indicated by many of the distribution maps in Dementiev and Gladkov (1954) which give wide east-west ranges to the northernmost races.

It is not possible to put every Swedish bird into mainly one category or another, but some 40 species have displayed invasion tendencies. This proves that the habit is common and the selection behind it rather intense.

In recent years the navigating ability of birds has been widely discussed. Irruption species seem to have an extra ability, that of locating food. How they find these regions is at present not at all understood, but, since a faculty for the rapid finding of food must be of survival value in the species, they have probably evolved a special sensitivity to sign-stimuli: perhaps, for example, the birds react to slight colour-differences in the woods, caused by the frequency of cones and seeds, as well as to the appearance of vegetation damaged by rodents. In this way Crossbills, Redpolls, Waxwings and Fieldfares, which move along fairly high in the air, could direct their further flight according to sign-stimuli reaching them from perhaps almost as far as the horizon. Their search would thus be a random one, but not a search like that of a foraging party of tits, working its way through the trees; instead it would be an optical search over a really wide range.

Those invasion birds which might find food somewhere within the taiga zone all year round have no encouragement to fly south or south-west. Their chances of finding food are greatest if they fly due west or due east. But a population of Crossbills, or the young of Great Spotted Woodpeckers or Nutcrackers, cannot, of

course, fly west every year. The species would then soon become extinct. Some sort of pendulum flight must occur, where invasions of subsequent years tend to go in different main directions. This would be possible if the old birds, after breeding, returned in the opposite direction to that in which they had travelled the previous year as young birds. For Crossbills and Waxwings such a system would approximately work, but the partial invasion species, such as Great Spotted Woodpeckers and Nutcrackers, where all the invaders are young birds, seem more complicated. The navigation skill and standard direction of invasion birds is a fascinating problem!

To save space, an outline comparison of invasion and ordinary migration is made below:

<i>Subject of comparison</i>	<i>Invasion</i>	<i>Ordinary migration</i>
Ultimate factor	Escape from food shortage during a certain year	Escape from food shortage during a certain season
Proximate factors, releasing the flight	1. Hormonal change, acting through metabolism, anchored by photoperiodism 2. Temperature, visibility, stability of air, time of day	1. Hormonal change, acting through metabolism, anchored by photoperiodism 2. Temperature, visibility, stability of air, time of day
Participants	The whole population or only part, particularly the young or females	The whole population or only part, particularly the young or females
Retarding stimulus of abundant food	Effect <i>very strong</i>	Effect <i>slight</i>
Tendency to return to the home or winter range of last year	<i>Very weak</i>	<i>Strong</i>
Performance of movement	<i>Irregular</i> in time and space	<i>Regular</i> in time and space
Breeding range	<i>Fluctuating</i>	<i>Constant</i>
Distribution of population	<i>Accumulation in areas rich in food</i>	<i>Population evenly spread</i>
Aim of navigation	<i>Location of food</i>	<i>Homing</i>
Clutches	<i>Variable</i> in numbers and size	<i>Less variable</i>
Subspeciation	<i>Less rapid</i>	<i>More rapid</i>
Peak performance	Crossbills: the whole population moves <i>once a year, in summer, westwards or eastwards</i>	Terns, Swallows: the whole population moves <i>twice a year, spring and autumn, northwards and southwards</i>

#### THE RHYTHM OF SPRUCE-FRUCTIFICATION AND ITS CONSEQUENCES

The economic importance of spruce and pine has led to records of their seed production in Sweden being kept for a number of years. The whole country was divided into about one hundred

small districts, from which the local forestry staff estimated the cone-crops every autumn and reported it as falling into one of the following five categories:

0	1	2	3	4
none	very few	not good	good	rich supply

This system has its obvious shortcomings. But some of the errors in judgement by the local supervisor are later revised as the reports are gathered and commented upon by those working on a regional level. Eventually all reports are given over to the Institute of Experimental Forestry, which annually publishes a pamphlet about the fructification (and flowering) of some selected species.

Tirén (1935) summarized the conclusions from the recorded fluctuations of spruce-fructification between 1895 and 1934. Through the courtesy of Professor Tirén later data have been available to the present writer. The material now covers 60 years.

The reports have been grouped into three regions, showing the combined values of the autumn cone crop in southern, central and northern Sweden (Fig. 3). Every figure is based on roughly 30 local reports.

The spruce seed ripens in autumn and falls out from the cone during spring, mostly in April-May. The data given in Fig. 3 for a certain autumn therefore mean that the supply of seeds the following winter was the same as for the autumn. It can be seen that the winters 1913-14, 1915-16, 1921-22, 1928-29, 1931-32, 1934-35, 1942-43, 1954-55 were rich in spruce cones over the whole of Sweden.

The conclusion, drawn already by Tirén (1935), that winters rich in cones come more often in southern than in northern Sweden is confirmed in the more recent observations. It may be difficult to find a regular rhythm in northern Sweden, but in southern Sweden it is quite clear that a *rich cone-winter comes every third or fourth year*. It is also obvious from Fig. 3 that the better the crop of cones is in one winter, the worse it must be the following winter. It may be pointed out here that Formosof (1933) reported a similar rhythm of fructification of the Arolla Pine (*Pinus cembra*).

Tirén pointed out that the rhythm was the result of two factors which determine the richness of flowering in spruce. High temperature during a sensitive period of the summer (June, early July) causes many buds to become flower-buds, instead of purely vegetation buds, giving rise to shoots. This results in rich flowering in the following spring, and many cones in the autumn. Secondly, after coning the trees become "tired", which means that they need an interval of some few years to be able to react again to the temperature. This also means that, for reaction, a gradually lower temperature stimulus is needed after a longer interval. These factors give the recorded rhythm to the tree. Nutrition is certainly



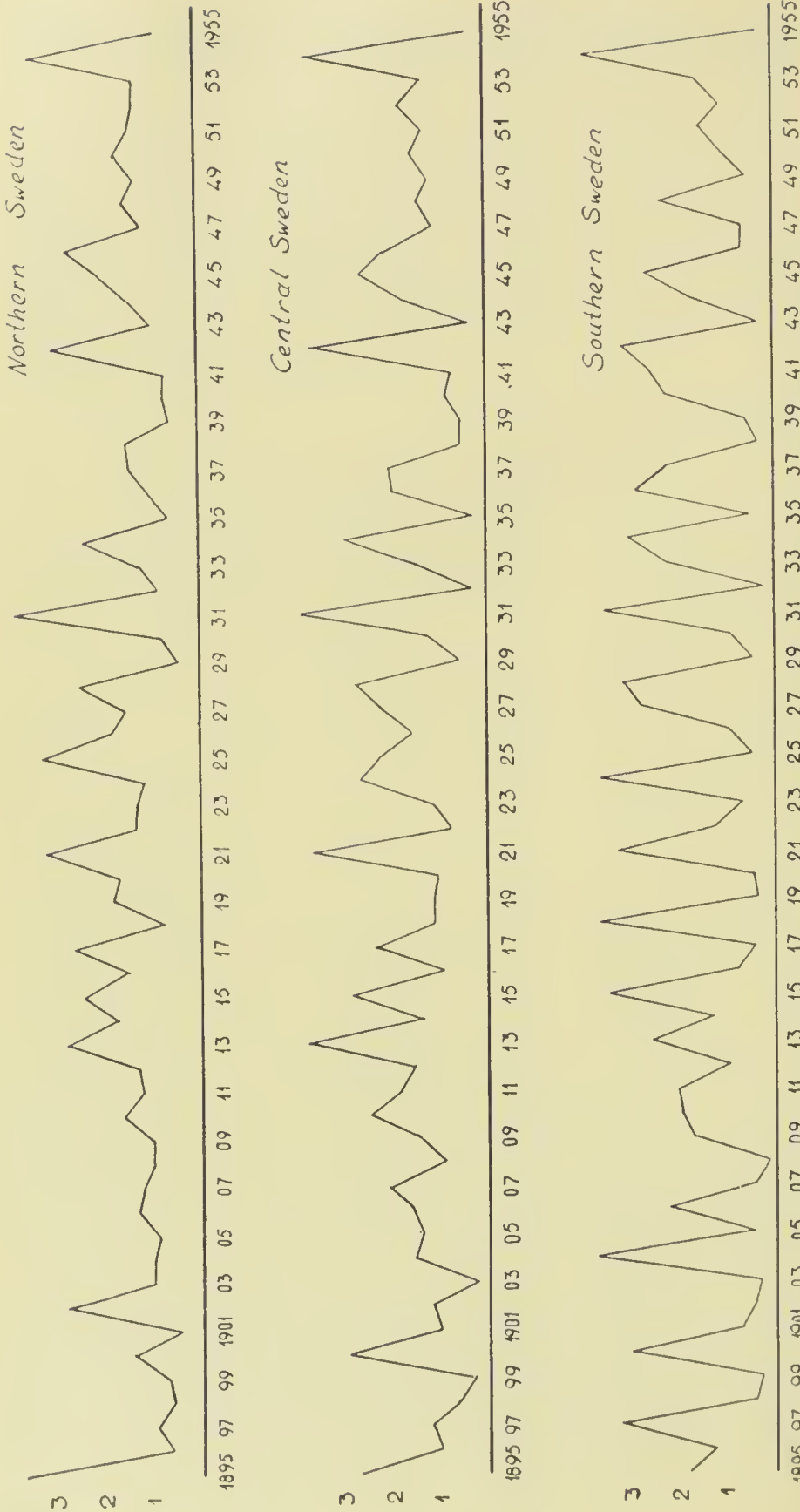


FIG. 3—THE CONE-CROP OF NORWAY SPRUCE (*Picea abies*) IN SWEDEN IN AUTUMN, 1895-1955. The data from about a hundred small districts are averaged, and presented in the scale 0-4. Note the regular rhythm of fructification, most clearly developed in southern Sweden.

involved as well, since isolated trees have more cones than trees in the forests.

The spruce seeds are eaten by a lot of birds in winter. During the winter of 1954-55 the writer observed Nuthatches and Marsh Tits, among other birds, feeding on the cones.

The Crossbills, Redpolls and Siskins all feed spruce seeds to their young. The March breeding of the Crossbills has in seed years a counterpart in the extremely early breeding of the Redpolls. In March-April 1955 some Redpoll nests were found containing eggs and young when the ground was covered by eighteen inches of snow and the temperature was  $-20^{\circ}\text{C}$ . (Witt-Strömer and Ingritz, 1956). The spring of 1932 was also rich in spruce seeds (*cf.* Fig. 3). In that spring Swanberg (1939) found Redpolls nesting in March within the coniferous region and again in late June in the *Salix* region of the high mountains in Lapland. Young birds accompanied the breeding females in the mountains. The second brood is raised on insects and there is probably only this one brood in a year when the spruce has few seeds. The Siskin also has bred early in seed-rich years (G. von Schweppenburg, 1930; Hederström, 1944). The latter author found a young Siskin, just fledged, at Skellefteå, at the very northern limit of the species, on 1st May 1943. The species is probably double-brooded in such years. There are few observation on Crossbills having second broods, but Hallberg (*in litt.*) has seen cases where young birds were associated with, and being fed by, males or females that had nests with eggs. These were in May.

Not only birds, however, follow the rhythm of the spruce. The Red Squirrel (*Sciurus vulgaris*) (Vartio, 1946; Lampio, 1948) feeds predominantly on flower-buds and spruce-seeds and, therefore, after a warm bud-forming summer, this mammal experiences two rich winters in succession, first one of buds and a second of seeds. The squirrel then has larger and more litters and a population peak follows, probably mostly because of the lower winter mortality. Afterwards, however, there is a population crash. In the autumn of 1943, at the same time as there was a big emigration of several bird-species from Scandinavia, the squirrel population was locally in some few months reduced to 1/450th of its former size (Lampio, 1948).

Emigrations of squirrels have been observed on several occasions at times of population crashes. In the autumn of 1914, after a population-peak due to the fine seed-winter of 1913-14 (*cf.* Fig. 3), emigrations were recorded in several localities. In one place 150 squirrels were shot in one single garden into which they had come to feed on apples; and 70 were watched when they swam over a narrow part of the Lake Hjälmaren, 220 yards wide. At the same time several were seen swimming over lakes in northern Sweden (Olofsson, 1916).

Squirrels are taken by Buzzards and Goshawks, and in large numbers by the Pine Marten (*Martes martes*). This last predator



FIG. 4—THE FRUITING OF SPRUCE (*Picea*), BIRCH (*Betula*), OAK (*Quercus*), BEECH (*Fagus*) AND PINE (*Pinus*) IN SOUTHERN SWEDEN, 1934-1954

The data from about thirty small districts are averaged, and presented in the scale 0-4. The rhythms of these trees are mostly synchronous, except for pine, the cones of which take a second year to mature, so that they are out of step with the rest.



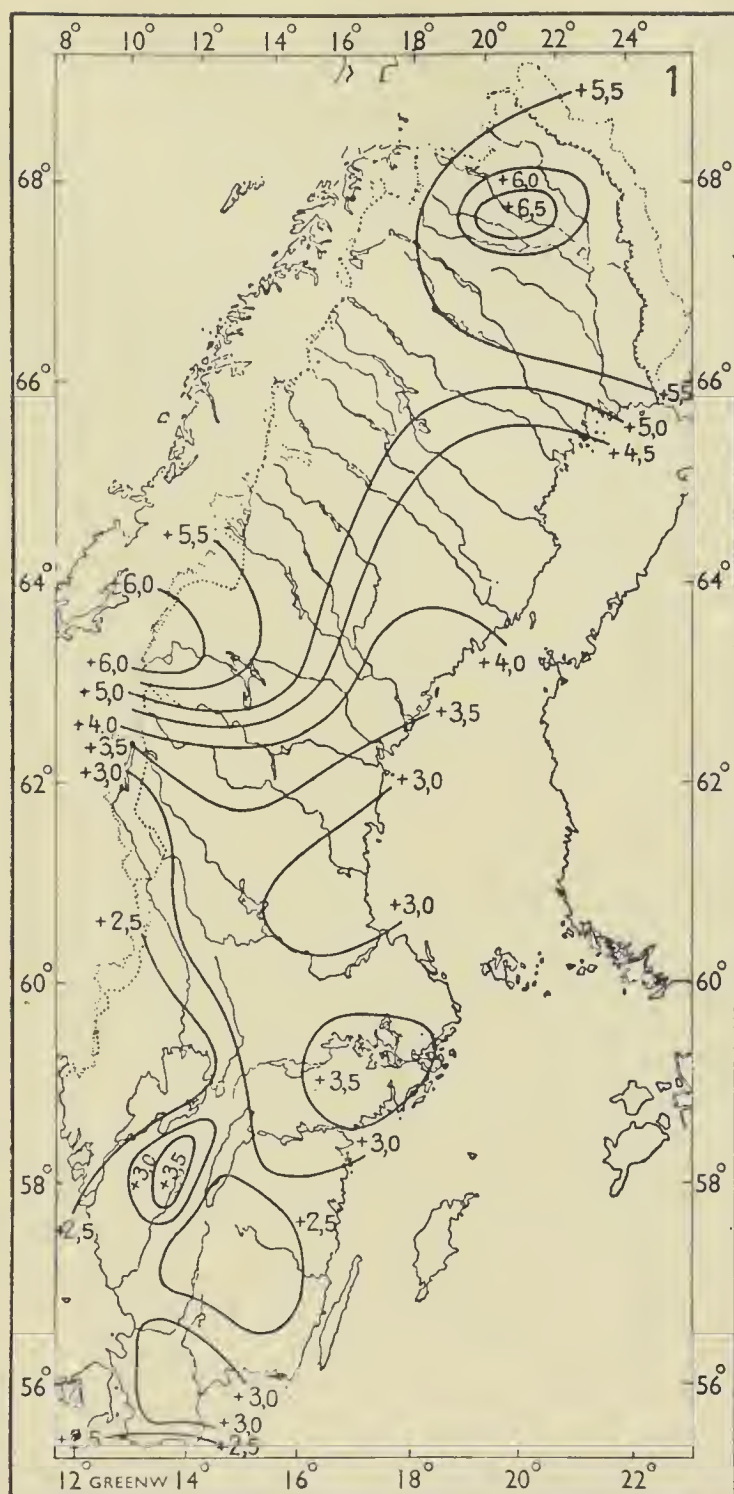


FIG. 5—THE DEVIATION FROM THE MEAN OF THE JUNE-TEMPERATURES (CENTIGRADE) IN SWEDEN IN 1953

The map is taken from the year-book of the Swedish Institute of Meteorology and Hydrology. This warm month caused a "bud-winter" in 1953-54 and a "seed-winter" in 1954-55. Population-peaks of game-birds (Galliformes) and Red Squirrels (*Sciurus vulgaris*), as well as emigrations of birds, e.g. Jays (*Garrulus glandarius*) in autumn 1955, were among its consequences.

fluctuates according to the number of squirrels (Lampio, 1948). There is thus a proved food-chain running like this: spruce rhythm—squirrels—martens.

When the spruce seed falls to the ground, it is an important food for some ground-living rodents (*Myopus schisticolor*, *Microtus agrestis*, *Apodemus sylvaticus* and *A. flavicollis*). *Myopus*, the Wood-Lemming, had population peaks in central Sweden in 1895, 1935 and 1945. All the recorded peaks followed winters in which the crops of spruce seeds were locally rich. The numbers of *Microtus* and *Apodemus* have also several times been recorded as reaching peaks in years of excellent spruce crops, notably in 1943.

In 1943 southern Sweden was invaded by owls (Hawk Owl, Short-eared Owl and Tengmalm's Owl) feeding on the abundant rodent population. Thus a further food-chain is established: spruce rhythm—ground rodents—owls.

This section may be summarized as follows. There is a rhythm in the seed production of the spruce and peak crops occur every 3-4 years in southern Sweden (but more seldom in northern Sweden). Some rodents have population peaks at the same time and emigration phenomena may occur in squirrels and Wood-Lemmings. Predators, like martens and owls, form population peaks as tertiary links in the food-chain.

#### GENERAL RHYTHM OF PERENNIAL PLANTS

The Swedish Institute of Experimental Forestry also publishes data on the fructification of pine (*Pinus*), birch (*Betula*), oak (*Quercus*) and beech (*Fagus*). In Fig. 4 it is demonstrated that these trees all tend to have synchronous fluctuations, with the exception of the pine. The pine is not synchronous because its cones are not ripe (and are therefore not reported to the Institute) until the second autumn after flowering. They are thus one year older than the fruits of all the other trees and serve in the figure as "controls". The co-variation of spruce, birch, oak and beech is statistically significant.

The factor causing the extremely rich flowering and fructification of many trees in 1954 was the high average temperature of June 1953 (Fig. 5). The deviation from the 1901-30 mean was in places as high as 6°C. (= 10.8°F.). It is of much interest that the synchronization of the rhythms of several tree species was strengthened by that warm month, as was also the spruce rhythm in different parts of Sweden (Fig. 3). In the prehistory of really great synchronous bird irruptions such an abnormal temperature is probably often involved.

With a view to supporting the suggestion, given earlier in this paper, that the 1953 irruption of Crossbills started from central Russia, the Swedish meteorological authorities were asked for details of the temperature there during June and the first half of July 1951. The temperature was said to have been more than

1°C. above average for the whole region of central Russia and western Siberia.

It could easily be foreseen that there would be a bad crop of all trees in 1955 as a consequence of the rich fruiting in 1954. The writer therefore forecast in February that there would be emigrations of certain named Swedish birds (Svårdson, 1955b) and most of them did, in fact, occur in autumn and were recorded at the Ottenby and Falsterbo bird observatories. Most numerous were the Jays, which appeared in very large flocks.

Since there is at least some annual synchronization of the fructification rhythms, the total output of food for birds and mammals may vary enormously. To take spruce seeds alone, the difference between good and bad years may be of the order 100:1 according to Professor Tirén. It is not known certainly at present if the rhythms of the berries, *Vaccinium*, *Empetrum*, and *Arctostaphylos* run parallel to those of the trees, but at least locally a very fine crop of berries was reported in 1954. There are in fact possibilities, which will have to be examined by the botanists, that the amounts of most flower buds, berries or seeds are largely synchronous, so that the whole question becomes of paramount importance for all vegetarian animals. It should be added that the Lemming lives in the *Salix-Betula* region of the mountains and that it may also be dependent on a rhythm of these or some other plants. It seems probable that the rhythm of flowering is accompanied by fluctuating amounts of important nutrients in the roots and shoots. In this way also root-feeding rodents could be affected. Johnsen (1928) and Hustich (1939) have both pointed out that there seems to be some coincidence between peak lemming years and the rich flowering of the pine.

Several game-birds have parallel population peaks, though they have different vegetable foods (Siivonen, 1948; Mackenzie, 1952). It is well known that the game-birds feed heavily on flower-buds and berries. Nordhagen (1928) thought the population peaks of Black and Willow Grouse and Ptarmigan had something to do with the peak years of berries, as there was a coincidence between the export from Norway of game-birds and of berries. Nordhagen thought the birds fed on the berries as long as these were not covered by snow in autumn and again in spring. The tannic acids in the berries, moreover, could have a curative effect upon grouse suffering from coccidiosis.

Since there are Finnish data indicating that game-birds have larger clutches in peak years (Siivonen 1954), an improved food supply during the previous winter seems probable. In the spring of 1948 the Finnish game-birds had larger clutches, according to Siivonen, and at least in Sweden the winter of 1947-48 was a rich "bud-winter", followed by the "seed-winter" of 1948-49 discussed earlier (cf. Figs. 3 and 4). The high temperature in the early summer of 1947 was the bud-forming factor.



Höglund (1956) proved the sensitivity to temperature of the young game-birds, which suffer from cold or rainy weather. It is interesting, therefore, that after the warm June of 1953 the game-bird population was high in autumn. But the number of birch and aspen flower-buds, also as a consequence of the June temperature, was very great and thus the birds had a rich supply of winter food. Possibly the quality of the food, too, was superior. In the spring of 1954 the population was still high and after a normal breeding it reached a peak in the autumn of 1954. The following autumn the population was lower and during the early summer of 1956 there was a widespread loss of downy chicks. In the autumn of 1956 the population consisted mainly of adult birds (up to 90%). The population crash in 1956 occurred in Norway, northern Sweden and Finland, and was less severe in southern Sweden. These are the opinions held by the hunters' association and their officers. No exact figures are available.

Summing up, it seems to the present writer rather probable that the much discussed problem of cycles in rodents and game-birds might be simpler than hitherto supposed. It has often been stressed that the population peaks of the predators form no major theoretical problem as they are dependent on the fluctuations of their food supply. Rodents and game-birds, however, have been supposed to have the same amount of vegetable food available every year. This is certainly wrong. They often eat buds or seeds and this is just the kind of vegetable food that is known to vary. The further study of cycles, therefore, seems to be partly a task for the botanists.

It is suggestive to look upon the high temperature during a sensitive period and the "tiredness" of the perennial plants as proximate factors only. The ultimate factor could be an adaptation, by means of which the plants minimize the damage done to them by the specialized seed-eaters. In the off-years, these seed-eaters are driven to emigration (some mammals and birds) or death (most rodents). As the plants have a longer span of life, the total number of seeds that result in seedlings might be higher if the fructification is concentrated in certain peaks, coming at intervals of some years.

In an early publication (1924) Elton gave details of a rodent population peak and a subsequent crash after exceptional fructification of beech. He also suggested that the proved better survival of the beech seedlings after the rodent crash could be an adaptation.

For the performance of pollination mutual adaptations in flowers and insects are known as one important ecological complex. Natural selection to save the seeds from destruction would be of the same strength. It might prove fertile to view fruiting rhythms, animal cycles and the invasion type of bird migration as one great ecological complex of mutual adaptation.

## ADDENDUM

The months of July and August 1955 were very hot in Sweden. As a result the flowering of the Rowan was exceptional in the spring of 1956 and the crop of its red berries was really amazing in the winter of 1956-57. Fieldfares and Waxwings invaded Sweden in numbers from December 1956 onwards. In early February 1957 the numbers of Waxwings at Umeå were larger than experienced observers had ever seen before; the same thing was reported from the province of Jämtland and the Hudiksvall district. In Stockholm Waxwings arrived in numbers during the last days of February and in two weeks they took all the berries that the Fieldfares had left. It seems probable that Waxwings will breed abundantly in Fenno-Scandia during 1957 and, since the Rowan will certainly give an inferior crop of berries in the autumn of 1957, because of "tiredness", there may then be a large-scale Waxwing movement outside Scandinavia.\*

## SUMMARY

1. It is suggested that invasions start annually, like ordinary migration, and that they are released by the same proximate factors. The movement is halted, however, early in some years, while it proceeds in others, the reason being that a rich food supply brings the flight to a stop. Seasonal passage figures for Siskins and White Wagtails at Ottenby, Sweden, demonstrate the difference between an invasion species and an ordinary migrant.

2. The Scandinavian literature on the invasions of Siskins in 1949, Waxwings and Redpolls in 1931, Crossbills in 1942 and Fieldfares in 1937 is reviewed. The last movement resulted in colonization of the Nearctic region.

3. Invasion is contrasted to ordinary migration in a number of respects which are discussed. The main difference is that while migration is an adaptation to a *seasonal food shortage*, invasion is a corresponding adaptation to *annual* food fluctuations.

4. The fructification of spruce in Sweden during 60 years is described and discussed. Some consequences are listed. Some other trees have synchronous rhythms.

5. It is suggested that the rhythm of fructification of some perennial plants, animal cycles and the invasion type of bird migration form one great ecological complex of mutual adaptation.

\*The second half of February and the beginning of March 1957 produced a sizeable invasion of Waxwings in the eastern counties of Scotland and England, the largest numbers to reach the British Isles since 1947 and 1949. This was an unusual time of year for these birds to arrive, but the invasion was evidently just the overflow from a far larger immigration into Scandinavia where plenty of food was available to halt the movement. It will be interesting to see if Dr. Svårdson's forecast of another invasion in the late autumn of 1957 will be proved correct.—Eds.

APPENDIX—SCIENTIFIC NAMES OF BIRD-SPECIES DEALT WITH  
IN THE TEXT

raptors (Falconidae)	Nuthatch ( <i>Sitta europaea</i> )
Buzzard ( <i>Buteo buteo</i> )	Fieldfare ( <i>Turdus pilaris</i> )
Goshawk ( <i>Accipiter gentilis</i> )	White Wagtail ( <i>Motacilla alba</i> )
Willow Grouse ( <i>Lagopus lagopus</i> )	Waxwing ( <i>Bombycilla garrulus</i> )
Ptarmigan ( <i>Lagopus mutus</i> )	shrikes (Laniidae)
Black Grouse ( <i>Lyrurus tetrix</i> )	Siskin ( <i>Carduelis spinus</i> )
skuas (Stercorariidae)	Redpoll ( <i>Carduelis flammea</i> )
owls (Strigidae)	Arctic Redpoll ( <i>Carduelis hornemanni</i> )
Hawk Owl ( <i>Surnia ulula</i> )	Bullfinch ( <i>Pyrrhula pyrrhula</i> )
Short-eared Owl ( <i>Asio flammeus</i> )	Crossbill ( <i>Loxia curvirostra</i> )
Tengmalm's Owl ( <i>Aegolius funereus</i> )	Parrot Crossbill ( <i>Loxia pityopsittacus</i> )
Great Spotted Woodpecker ( <i>Dendrocopos major</i> )	Two-barred Crossbill ( <i>Loxia leucoptera</i> )
Nutcracker ( <i>Nucifraga caryocatactes</i> )	Brambling ( <i>Fringilla montifringilla</i> )
Jay ( <i>Garrulus glandarius</i> )	
Marsh Tit ( <i>Parus palustris</i> )	
Long-tailed Tit ( <i>Aegithalos caudatus</i> )	

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# THE MOULT MIGRATION OF THE SHELDUCK FROM CHESHIRE IN 1956

By R. H. ALLEN and G. RUTTER

IN 1956, observations were made for the seventh year in succession on the departure flights of Shelduck (*Tadorna tadorna*) from the River Mersey at Weston, near Runcorn, Cheshire, and details are given in Table I. The moult migration in 1955 has already been described in *British Birds* (*antea*, vol. xlix, pp. 211-226). We found then that Shelduck from the estuary of the Dee crossed Wirral and came to the Mersey estuary before continuing their flight; and that adverse winds from the east and south-east halted migration completely. The observations in 1956 confirmed these conclusions. The map on page 222 of the 1955 report might with advantage be examined again, as it will make the following notes more easy to follow.

TABLE I—DEPARTURES OF SHELDUCK (*Tadorna tadorna*) FROM WESTON, RUNCORN, CHESHIRE

Date	Number of flights	Number of birds in final departure flights	Total birds
5th July	2	8—60	68
8th „	2	21—35	56
9th „	3	50—15—22	87
10th „	2	24—28	52
18th „	3	38—52—47	137
19th „	1	53	53
20th „	7	60—86—87—18—110—11—105	477
21st „	6	64—62—130—35—52—64	407
22nd „	7	42—23—18—29—21—17—20	170
23rd „	4	22—30—18—48	118
24th „	3	16—30—50	96
25th „	5	4—20—47—10—68	149
26th „	3	6—40—29	75
4th August	2	29—28	57
7th „	1	34	34
Totals	51		2036

## SUMMARY OF FLIGHT TIMES (G.M.T.)

4	Before 7.30 p.m.
12	7.30 p.m. to 8 p.m.
12	8.0 p.m. to 8.30 p.m.
19	8.30 p.m. to 9 p.m.
3	After 9 p.m.
1	At 5.40 a.m.

Total 51

With adverse winds early in July, followed by showery conditions, flights were observed on fewer days than in the previous year, although the number of duck recorded was slightly larger—

2,036 on 15 days, compared with 1,909 on 20 days in 1955. Up to 10th July departures were about normal, but then there followed a week's hold-up due to the persistence of east or south-east winds.

On 18th and 19th July, despite slight contrary breezes, four flight departures were seen. Then on the 20th, when conditions were really favourable (i.e. fine clear sky and a following light west breeze), there was great activity. The birds arrived from the direction of the River Dee, flying across Wirral from the west, and, apart from their customary deflection south-east over the Bird Reserve at Weston, near Runcorn, on the River Weaver (so as to avoid the smoke of Runcorn, and Widnes), continued in direct flight to the east without circling and without any birds returning. Altogether 477 were seen to depart. The following night was nearly as good with 407 birds seen departing from Weston; there was, however, more hesitancy, with flocks circling and 81 birds returning. These latter birds joined up with later flights from the Dee. With flights on succeeding nights the migration was virtually over on 26th July, as bad weather persisted into August.

Of the last 3 flights recorded two were at abnormal times of day according to our experience in other years. One was a flight of 29 at 5 p.m. (G.M.T.) on 4th August, and the other a flight of 34 at 5.40 a.m. (G.M.T.) on 7th August. We can only say that in both instances there was a favourable N.W. wind, a clear sky and that the general weather in this period was unsettled, with thunderstorms about.

Possibly due to the unsettled weather conditions in 1956, only two records of evening flights further inland (beyond 5 miles) were received. One was over Woolston, 11 miles eastward near the Manchester Ship Canal (T. Waring, 8th July), and the other was over Great Budworth Mere, 11 miles to the south-east (G. Trelfa, 4th August). The latter flight, 50 in number, was seen flying eastward at 6.15 p.m. (G.M.T.), but was not seen at Weston and so has not been included in our total.

Also for the same reason we have excluded two flights seen from Dutton (4 miles inland to the south-east) (R. and I. Walton). These were on 21st and 22nd July and consisted of *ca.* 150 and *ca.* 250 birds respectively, and were at high altitudes (over 1,000 ft.). As neither of these large flocks was seen by at least 4 watchers at Weston and also because of the height at which they were flying, it is possible that these birds were on a more southerly line of cross-country flight. This gives rise to speculation about possible lines of flight from Cardigan Bay and the Conway estuary to the Humber.

From the River Dee at Burton, E. M. Conder was able to add records of movements on 9th, 19th and 20th July. He found that the route followed by the birds was the same as in the previous year (across Wirral to the Mersey) with variation depending on

where they rose from in the estuary on account of the state of the tide.

On 1st July, S. G. Hopkins and R. H. Allen made a count of Shelduck at high water (23.4 ft. at 5 p.m.) on the Dee near Burton from Denhill Colliery tip. This came to 950 although there had been few there at noon the same day.

The following evening a count was made on the Mersey at Ince Ferry, but only *ca.* 50 were to be seen. Another count at Ince on 8th July came to 97 plus young (3 families). Ince-Stanlow, 5 miles down stream from Weston, is the most favoured haunt of Shelduck on the Mersey at high water. The low number present at this time is an indication that most of the migrating Shelduck come from the Dee or beyond, and drop down to or pass over the Mersey estuary on their flight. In early July 1957 an attempt will be made to make a census of all Shelduck on the Dee by means of simultaneous counts at strategic points on both banks. If successful, this should lead to a clearer indication of the areas from which these migrating Shelduck come.

A visit made by four of us to the Longdendale Valley, 32 miles eastward, on 27th July unfortunately proved to be on a blank night for flights. It was here (at Tintwistle) a few years ago that E. M. Conder observed a flock flying eastward and this was a strong indication that this valley, which contains a three mile line of reservoirs, is one of the most likely routes over the Pennines to the Humber.

#### ACKNOWLEDGEMENTS

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#### FOOTNOTE

Michael J. Seago, Editor of the *Norfolk Bird Report*, has drawn our attention to several entries in the 1956 diary of R. Chestney, the Nature Conservancy Warden for Scolt Head on the N. Norfolk coast. These entries show that from the beginning of July small numbers of Shelduck passed east off Scolt, two or three parties of 5-16 birds being seen daily. Then during 14th-17th July large flocks (largest 80, average about 30) passed east, and a total of 3,000-4,000 was estimated during these four days. However, as less than 300 Shelduck had been seen to depart from the Mersey before 18th July, it seems that few of the birds passing Scolt Head came from the Mersey and Dee.



## NOTES

**Black-headed Gulls feeding on hawthorn berries.**—The note by R. Harrison (*antea*, p. 75), describing the behaviour of a party of about 10 Black-headed Gulls (*Larus ridibundus*) which were plucking and eating the berries from a hawthorn hedge, exactly parallels an occurrence which I witnessed at Rumworth reservoir, near Bolton, Lancashire, on 22nd October 1956. In this instance about 30 birds were involved and, since they were not to be seen on the following day, they may well have comprised a wandering band. It is interesting to note that this took place only 17 days after Mr. Harrison's observation, and that Rumworth lies about 14 miles N.N.W. of the Altrincham Sewage Works where he recorded it.

ERIC GORTON

**Fieldfare in Kent in June.**—It is perhaps of interest to record that on 28th June 1956, at about 1800 hours G.M.T., I saw a Fieldfare (*Turdus pilaris*) at Brookland in Romney Marsh, Kent. The bird was feeding on the ground about 10 yards from me for some 3 minutes, before it flew up into a willow tree and disappeared.

JAMES J. M. FLEGG

[Full identification details have been supplied to us by Mr. Flegg.—EDS.]

**Crossbills feeding on grain in gull-pellets.**—In his paper "Gulls feeding on grain" (*antea*, vol. xlix, pp. 400-404), T. A. W. Davis refers to the presence of large numbers of corn-pellets on the Inner Farne, Northumberland, noted by P. J. Conder in October 1952. In early September 1956, numerous pellets of this type left by roosting gulls (*Larus* spp.) were scattered over the same island, some intact and some broken down to little heaps of material. They were most prominent where lying on bare rock and their main constituent appeared to be oat-husks with a small proportion of undigested grain.

Two immature Crossbills (*Loxia curvirostra*) came in on 3rd September with a large arrival of Passerines, and on this and the following day were seen to be feeding on the remains of pellets at various points on the island where the surface was rocky and free of vegetation; their activities could thus be clearly observed. It is interesting that the birds should have recognized this presumably unfamiliar material as food, and should have preferred it to other plant-seeds such as dock and thistle which were available.

E. L. ARNOLD and J. C. S. ELLIS

**Melanistic Ringed Plover in Kent.**—While watching a group of waders at Allhallows-on-Sea, Kent, on 21st October 1956, we observed an apparently all-black wader, which subsequently proved to be a melanistic Ringed Plover (*Charadrius hiaticula*). From ca. 100 yards with the aid of  $\times 40$  telescope and moderate light it appeared nearly black on both the upper- and under-parts, except for a rough crescent-shaped mark on the lower neck, and a small white patch on the forehead. One of us (E.J.) noted a pale wing-

bar in flight. The legs appeared normal. The method of feeding and the bird's mannerisms appeared identical to those of other Ringed Plovers present.

P. E. BEARD, BRUCE COLEMAN and EDWARD JONES

This record is of unusual interest, for with the exception of the not uncommon melanistic variety of the Snipe (*Capella gallinago*), often referred to as "Sabine's Snipe", melanism in the waders is apparently a condition of extreme rarity. I am, at the time of writing, aware of only five other instances of melanism in this group of birds. One of these records also refers to the Ringed Plover. This was a bird seen at Gebel Maryam Lake, Egypt, on 9th May 1955; it was dark brown above and almost black on the under-parts, and had the normal white collar, wing-bars, and outer tail-feathers. It was seen by Roger Norman to whom I am indebted for these details. On 18th April 1955, near Milton, Cambridgeshire, G. M. S. Easy saw a Redshank (*Tringa totanus*) with a much darker back than normal, and the under-parts as black as those of the Spotted Redshank (*Tringa erythropus*) in breeding plumage. The remaining records relate to the Lapwing (*Vanellus vanellus*). K. G. Spencer in *The Lapwing in Britain* (1953), in a discussion of some ninety plumage-aberrations of this species, could list only two cases of true melanism—two chicks and one adult bird. Lt.-Col. J. K. Stanford and David Cannon saw a melanistic adult Lapwing near Stapleford, Wiltshire, in October 1956. This bird was entirely black and dark brown in shade, and had greyish under-wings. I am indebted to Mr. Spencer for details of this last record. BRYAN L. SAGE

[In 1917, by the R. Canche, at Étapes, in N. France, I saw a Redshank with a black breast. It was so dark that, until it flew and I saw its wing-pattern, I took it for a Spotted Redshank.—A.W.B.]

**Roller in Co. Wexford.**—An adult Roller (*Coracias garrulus*) was picked up dead at Hook Point Lighthouse, Co. Wexford, on 18th April 1956. It was quite fresh when found and Mr. J. J. Lavelle, the lightkeeper who forwarded it to me in the flesh, thought that it must have struck the lighthouse or wires during the fog which had prevailed a few nights earlier.

The specimen, now in the National Museum of Ireland, Dublin, is the first ever recorded in Ireland in spring and the first one at all since 1900: the eleven previous Irish records were all between 1831 and 1900. ROBERT F. RUTLEDGE

**Black Stork in Worcestershire.**—On 31st May 1956, I was passing through the Wyre Forest, Worcestershire, in mid-afternoon, accompanied by a party of boys from Bushbury Hill Secondary School, when a Black Stork (*Ciconia nigra*) was flushed from Dowles Brook. From our position of about 30 feet above the brook, black plumage, long red bill and legs, and slow heron-like wing-beats were noted immediately; and as the bird rose higher the white belly was also clearly observed. Once it was above the level

of the trees, the bird turned and came gliding back over our heads; this gave us an excellent opportunity to see that the lower breast, as well as the belly and under tail-coverts, was white. The bird then circled round and disappeared.

This is the first record of the Black Stork in Worcestershire.

R. J. BRADNEY

[As we go to press, Mr. E. M. Rutter, Editor of *The Birds of Shropshire*, tells us that Miss. E. J. Peele and Miss P. Barlee saw a stork in Shropshire on 30th May 1956, the day before the Worcestershire record. This bird was watched for about two minutes flying at a height of about 60 feet at Haughmond Hill, 3 miles east of Shrewsbury, and after circling it flew off in the direction of Wrekin, a line which would bring it approximately to the Wrye Forest. The characteristic shape was well seen, but in poor light the species was not determined.—EDS.]

**Blue-winged Teal in Gloucestershire.**—On 24th December 1956, whilst feeding the collection at the Wildfowl Trust, Slimbridge, Gloucestershire, I saw an adult male Blue-winged Teal (*Anas discors*) over one of the enclosures. It was flying with some Shovelers (*Spatula clypeata*) and settled with them on one of the ponds in the grounds. Within five minutes it was feeding on the grain with the rest of the birds and did not show the slightest indication of fear, whilst being watched at fifteen yards' range. It was so tame that it was possible to see its plumage very clearly. The white crescent-shaped patch on the face was very distinctive and extended up and over the eyes, meeting at the back of the neck. The whole of its plumage was slightly brighter than that of any of the Blue-winged Teal in the collection and in size it was a larger-bird than any of these. It was seen on several occasions and finally on 28th December it was caught in a trap. Since then, it has been living with the collection specimens and has paired up with one of the ducks.

If this bird has not escaped from captivity, and so far there is no evidence that it has, then it is the eleventh record of this North American species for the British Isles and the first for Gloucestershire.

M. DAVY

Inquiries of the principal keepers of wildfowl in Britain and Europe have failed to yield any information about "escapes": there seem to be very few birds of this species in captivity in Europe and none have bred recently except at Slimbridge, where all the birds reared have been pinioned.

R. E. Stewart and J. W. Aldrich (*Proc. Biol. Soc. of Washington*, 1956, vol.69, pp. 29-36) have recently distinguished two populations of *Anas discors*, the typical race breeding in the prairies of North America and another, named by them *A. d. orphna*, breeding in salt or brackish tidal marshes along the Atlantic seaboard from north-eastern North Carolina to New Brunswick and Prince Edward Island. Males of *A. d. orphna* are distinguished from the typical race by being darker, with black



areas on the feathers more intensely black and other colours more pronounced. They seem also to be larger on the average. While it is not possible to determine the race to which the living Gloucestershire bird belongs, without comparison with adequate series of skins, comparison of the bird with two other live males in the Slimbridge collection seems to show that this wild individual differs from them and agrees closely in appearance with the description of the Atlantic race. The appearance of the white face patch, though distinctive, is apparently of no taxonomic value, since "the extension of white on the head above the eye and to the nape of the neck has no geographic significance" (Stewart and Aldrich, *loc. cit.*).

HUGH BOYD

**The identification of Baird's and Semi-palmated Sandpipers.—**

That there might be considerable difficulty in separating these two North American waders in the field did not occur to us until we found it necessary to make a decision in favour of one or the other with a small greyish wader at Fair Isle at the end of May 1956 (Williamson and Alexander, *in press*). This bird, first thought possibly to be a Baird's (*Calidris bairdii*), was in company with a group of Dunlins (*C. alpina*). After watching for some time we provisionally identified it as either a Semi-palmated (*C. pusilla*) or a Western Sandpiper (*C. maurii*) when it was seen through a telescope that the toes were partially webbed. Identification as the former was confirmed later by trapping.

There are plumage-differences given for Baird's and Semi-palmated, but they appear to be slight, and plumage is notoriously difficult in waders when in change from winter- to summer-dress and *vice versa*. Rowan (1926), Witherby *et al.* (1944) and others have discussed the difficulties: in both, the mantle-pattern could be described as "scaly" (Peterson, 1947), the wing- and tail-patterns are almost identical, and both have legs which appear to be black at short distance, but are in reality dark olive-green at close quarters.

In the case of the Fair Isle example we rejected Baird's because the bird was obviously smaller than a Dunlin, and we felt from a glance at the measurements given by Witherby (*op. cit.*, pp. 238, 240, 268) that this ought not to be so (Baird's, ♂ wing 116.5-127.5 mm., ♀ 113-132 mm.; Southern Dunlin *schinzii*, ♂ 106-112 mm., ♀ 110-120 mm.; Northern Dunlin *alpina*, ♂ 111-116 mm., ♀ 111-117 mm., with up to 122 mm. recorded). However, those who have recorded undoubted Baird's Sandpipers in this country in recent years have all stressed that their specimens were *smaller* than Dunlins (White, 1951; Fluke, 1953; Boyd, 1955). It would be highly dangerous, therefore, to attempt to discriminate between these two Americans on the basis of size-comparison with a Dunlin.

Clearly this disparity is due to Baird's having a proportionately longer wing, and it has in fact been remarked that the wing-tip overlaps the tail-tip and gives the bird a pronounced "horizontal" stance (Fluke, 1953; Wallace, 1957). Moreover, one observer

has commented that Baird's is proportionately shorter in the leg than a Dunlin (Boyd, 1955). The Semi-palmated at Fair Isle struck us as being a rather "upright" bird, due partly to the fact that the wings did not overlap the tail-end, and partly to its proportionately longer legs when it stood alongside a Dunlin.

It seems to us that this difference in "jizz" may well be the most valuable field-character for distinguishing between these critical American species, especially on this side of the Atlantic where the Dunlin is their most likely company. The projection of the wing beyond the tail in Baird's is well seen in the excellent photographs of the Sussex-Kent example taken by G. des Forges (*antea*, vol. xlv, plates 44-45). Those of the Norfolk Semi-palmated taken by R. P. Bagnall-Oakeley and published in *British Birds* (vol. xlvii, plates 27-28) do not depict this bird in the same advantageous position; but other photographs taken at the same time, and which Mr. Bagnall-Oakeley kindly sent to us at Fair Isle, do indicate a wing-tip which falls short of the end of the tail by several millimetres.

KENNETH WILLIAMSON and H. G. ALEXANDER

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**Feeding association between Coot and Little Grebe.**—With reference to the note on this subject (*antea*, vol. xlix, p. 501), it is perhaps of interest that I have a record of a similar feeding habit in Australia, in this case involving the Coot (*Fulica atra*), the Dusky Moorhen (*Gallinula tenebrosa*) and the Australian Little Grebe (*Podiceps novae-hollandiae*). The Australian Little Grebe was, until quite recently, considered a subspecies of the English bird, and is identical in appearance and habits. The Dusky Moorhen is, likewise, barely distinguishable in the field from its English counterpart.

On 25th April 1957, at a lagoon near Sydney, a number of Coot and Moorhens were feeding in very shallow water in which dense weed was growing. The birds were swimming slowly through the mass of weed, picking food from the surface. Four

Little Grebes had attached themselves to separate partners, three selecting a Coot, the other a Moorhen. Each grebe stationed itself directly behind its partner and, feeding in the head-submerged position, followed its every movement. The head of the grebe would be directly under the tail of the bird it escorted and, in fact, on a number of occasions when the leading bird stopped suddenly the grebe collided with it. The Coots resented this and turned and attempted to peck their clumsy escorts. It was obvious from the neck movements of the grebes that they were catching underwater life disturbed by the other birds' progress through the weed and on one occasion a small fish was brought to the surface to be swallowed. In deeper water, numerous grebes were feeding and diving in a normal manner and showed no interest in the large numbers of Coot also diving there.

JOHN N. HOBBS

**Montagu's Harrier pellet containing whole egg.**—In the second week of May 1956, we visited the haunt of a pair of breeding Montagu's Harriers (*Circus pygargus*) in southern England, and during our stay we discovered a narrow grassy path used by the harriers as a place upon which to regurgitate their pellets. A number of these pellets were found and examined, but one particularly attracted our attention because deeply imbedded in its side was a rounded object which we thought to be a small pebble. After it had been prized away from the other material, however, it was found, to our surprise, to be a whole egg—perhaps of a ground-nesting Passerine. Unfortunately it was dropped soon afterwards, with the result that the white-and-yolk contents spread over the ground near-by.

It does seem remarkable that an egg, though intact, should have been capable of resisting the digestive juices of one of these harriers.

BERNARD KING and K. B. ROOKE

**Meat skewer swallowed by Herring Gull chick.**—On 18th June 1957, whilst on the stack rock off Skokholm Island, Pembrokeshire, I found a young Herring Gull (*Larus argentatus*) which had completely swallowed, blunt end first, a wooden meat skewer, 6 inches long and a quarter of an inch in diameter. The chick, which was about 14 days old, had constantly been trying to regurgitate the skewer, with the result that the sharp point had penetrated through the neck below the beak. After removal of the skewer, the chick was returned to its nest area; when seen the following day it appeared to have recovered completely.

J. M. HARROP

**Lapwing apparently with brood of seven.**—On 11th June 1957, in a field at Great Strickland, Westmorland, I observed a pair of Lapwings (*Vanellus vanellus*), one of which was obviously brooding young. On my entering the field for the purpose of ringing the young, both adults took wing and they were the only adults seen in the vicinity. I was therefore surprised to find six young birds, all of the same size and age, i.e. about two or three days old, and all having "frozen" within an area of about four square yards. Whilst I was ringing the young, only two adults were seen to be flying round and, when I left the field and returned to my car, only two adults returned. I waited in the car until all



the young birds began to move and was then surprised to see that there were actually seven chicks, one having been missed when I entered the field.

Although the above incident may not be proof that a brood of seven had been raised by one pair, the fact that all the young birds were found close together and that only one pair of adults was seen might suggest this. It would be possible, of course, that two females had laid eggs in one nest and all had been hatched by one pair.

R. M. BAND

**Yellow Wagtail wintering in Surrey.**—On 9th November 1956, a Yellow Wagtail (*Motacilla flava flavissima*) was reported by one of the workmen at Beddington Sewage Farm, Hackbridge, Surrey. The following day a party of observers including H. P. Medhurst and the writer saw the bird, which proved to be an adult male in good plumage. Throughout November and December it was regularly recorded feeding amongst the grazing cattle by numerous observers. Records for January to March were rather less frequent, but this was almost certainly due to the fact that by then it had practically ceased to utter the call which readily drew attention to its presence during the early part of its stay. When the cattle were taken in, in late January, the bird consorted with Pied Wagtails (*Motacilla alba yarrellii*) on the flooding water meadows or the ploughed fields. Two brief spells of severe cold weather appeared to have no adverse effect on the Yellow Wagtail and during the second of these, on 26th December, it was seen feeding in deep snow along a dyke wall. The wintering bird was last definitely recorded on 22nd March, the first of the passage birds being present on the 24th.

This appears to be the first recorded wintering of this species in Great Britain.

B. S. MILNE

**Magpie robbing Kestrel.**—On 3rd October 1955, at Saunton, Devonshire, I saw a Kestrel (*Falco tinnunculus*) that had been perching for some minutes on some telegraph wires by a grass field, drop down and catch something in the grass. The Kestrel had no sooner seized its prey than a Magpie (*Pica pica*) flew out of an adjacent bush and landed straight on the Kestrel's back, where it beat its wings rapidly to maintain balance and pecked furiously at the Kestrel's head. The Kestrel dropped whatever it was holding and this was immediately grabbed by the Magpie which then flew back into the bush.

BRYAN L. SAGE

## REVIEWS

THE WILDFOWL TRUST: EIGHTH ANNUAL REPORT, 1954-1956. Edited by PETER SCOTT and HUGH BOYD. (*Country Life*, London, 1957). 156 pages, 24 plates, many text-figures, line-drawings and tables. 10s.

IN THE sixth and seventh annual reports of the Wildfowl Trust

original scientific papers were included for the first time. The increasing complexity of papers on population dynamics has, however, led to some reversal of this policy, so that the present report includes a number of short papers but leaves the more involved subjects for other journals.

The programme of wildfowl counts and ringing, which provides the raw material for the population studies, has been continued successfully. In the 1955-56 season, for example, 5,822 ducks and 1,144 geese were ringed. Mallard (*Anas platyrhynchos*) and Teal (*A. crecca*) predominated in the ducks and the next most numerous were Wigeon (*A. penelope*) with about 150. Very few diving ducks are ringed in this country. The geese were mostly Pink-footed (*Anser arvensis brachyrhynchus*), and two 'round-ups' of Canada Geese (*Branta canadensis*) were made at the request of landowners, surplus birds being released in Anglesey, Staffordshire, Pembrokeshire and Hyde Park, London. For the benefit of future students it seems a pity that details are not given of the number introduced in each locality.

Wildfowl counts were made at 526 localities regularly (146 coastal and 380 inland), and at another 187 occasionally, in the first of the winters concerned. The duck totals are considered to be open to suspicion statistically if over 10% of the waters, or if waters normally providing more than 10% of the ducks, are missed on any particular date. By this criterion adequate counts were obtained on single dates in October, November, December and March, while the January figure satisfied the standard laid down but may be biased owing to poor cover in Scotland. The November and December counts embraced over 190,000 birds. Taking the latter month as an example, there were 62,000 Mallard, 26,000 Teal, 83,000 Wigeon, 2,000 Pintail (*Anas acuta*) and over 1,000 Shoveller (*Spatula clypeata*), and in these figures the interpolation does not exceed 10%. Diving ducks consisted of nearly 8,000 Pochard (*Aythya ferina*), over 9,000 Tufted Duck (*A. fuligula*) and little over 1,000 Goldeneye (*Bucephala clangula*), the interpolations being less than 1%. While the Mallard and Wigeon were fairly evenly spread, the Teal were more concentrated in the South and Midlands. Most of the Pintail are found in less than 25 favoured areas, the majority of the birds being in the N.W. Midlands. A total for the whole country of almost 4,500 Pintail was found in February, the largest numbers being in that month and in March. It is surprising to read that the number of waters carrying over a hundred birds was only 19 for Pochard and 30 for Tufted Duck, and details of the number of large reservoirs not included in the data would be welcome. Indeed, some indication of all the chief wildfowl haunts not covered by the counts would make the results of more interest and value. The Irish figures included in the counts are doubtfully representative of that country, being based on only 16 waters out of the sample of 526.

In a note on the development of the Trust's programme of scientific research, G. V. T. Matthews includes among current projects investigations into the use of aerial survey methods of estimating wildfowl numbers and into food preferences. Combined with a project to study critically the nature and distribution of wildfowl habitats, this programme is aimed primarily at acquiring knowledge which will assist in the conservation of wildfowl. Close liaison with the Nature Conservancy offers hope of the eventual realization of plans for a series of wildfowl refuges spread over the country.

At Slimbridge experience suggests that a very wet breeding season may have a bearing on the incidence of Aspergillosis, pathogenic mould being found in a number of fertile eggs that failed to hatch, while a relatively large number of goslings succumbed to Mycosis. Provision of "relatively fast-flowing water" through the rearing pens avoided the former concentration of water fleas (*Daphnia pulex*) which had been the host of *Acuaria uncinata*, a worm inhabiting the proventriculus and causing wasting and subsequent death. In addition work is proceeding on studies of the parasites of the Anatidae, and material is provided to other institutions and individual scientists for specialized researches.

A report on wild geese at Slimbridge in the seasons 1954-56 includes a summary of the occurrence of species other than the White-fronted (*Anser a. albifrons*) in the last ten years. Pink-footed Geese used to occur in the thirties in numbers ranging from annual peaks of 550 to 1,250, but declined to the present level of 50 to 100 or so between 1938 and 1941. Lesser White-fronted (*A. erythropus*) and Bean Geese (*A. a. arvensis*) have each occurred in nine of the last ten years, and the number of the former seen since 1945 is now at least 30. Until quite recently there used to be quite large numbers of *Anser a. albifrons* towards the end of December, but in the last few years the greatest numbers have been in February and early March. In this case regular counts have revealed a changing pattern of seasonal distribution for which no cause is yet known.

In a paper on "Summer recoveries of Wigeon, Pintail, Shoveler and Tufted Duck ringed in Britain", Hugh Boyd discusses the possible sources of error in using recoveries as a true sample, the chief of which appears to be that there *may* be more shooting in the breeding season in the U.S.S.R. than in Scandinavia and Finland, thus exaggerating the importance of the U.S.S.R. as a source of our wintering ducks. Moreover, most of the duck ringing in the British Isles has been in the south of England, an important factor in any attempt at analysing recovery data for British-ringed birds. Possibly due to greater protection, surprisingly few Wigeon have been recovered in the breeding areas outside the U.S.S.R., and there is an important concentration of recoveries in the lower basin of the River Ob (ca. 65°N., 65°E.)



east of the Ural Mountains. No Wigeon ringed in Britain have yet been recovered in Iceland in summer, but as 45 Iceland-ringed Wigeon have been recovered here it seems that they do not normally penetrate the south of England where most of the ringing has been done.

Of 17 Pintail recoveries none have been west of  $20^{\circ}\text{E.}$ , south of about  $52^{\circ}\text{N.}$  or east of  $72^{\circ}\text{E.}$  Wigeon have reached  $86^{\circ}\text{E.}$  Only three of the 17 have been in Asia. The few recoveries of British-ringed Shoveler come only from the north-western extremity of the Palaearctic range of the species, north-east to  $66^{\circ}\text{N.}$  and  $58^{\circ}\text{E.}$  Most of the Tufted Duck recoveries come from northern Russia down to about  $47^{\circ}\text{N.}$ , but it should be noted that 19 of the 21 recoveries were of birds ringed in London or Essex.

The conclusion is drawn that the ducks coming in winter to south and east England are principally from N.W. Russia and Finland. There is another short paper by Boyd on the physical and climatic features of N.W. Russia so far as they are likely to affect the duck population.

In a note on "Recoveries of British-ringed Grey Lag Geese" (*Anser anser*) Boyd finds that the evidence from 13 recoveries out of 50 birds ringed in Iceland between 1932 and 1938 and from 84 recoveries out of 431 birds ringed in the British Isles all suggests that the Icelandic population probably winters exclusively in Britain. Though the series available is a small one, the annual death-rate is estimated to be very similar to that of Pinkfeet, namely  $23.1\% \pm 2.19\%$  compared with  $26\% \pm 1.6\%$ , and to that of Whitefronts which is about 28%.

Counts in all the chief haunts of *Anser a. albifrons* in this country in February 1956 suggest a total of about 6,600, and it is hazarded that in recent years the population has varied between about 4,000 and 8,000 except in January 1947, when there may have been as many as 10,500. As already noted for the Slimbridge flock, a large part of the population in recent years has delayed its arrival until February. There are only a dozen or so areas where White-fronted Geese of the typical race occur in numbers with any regularity. In a series of mortality calculations it is suggested that out of an average British winter population of 7,000 the total annual losses are 2,420. This seems a substantial figure, particularly when it is taken into account that the total N.W. European wintering population of this goose is only some 15-20,000. Yet the population is said to maintain itself.

Other papers deal in narrative form with the travels of members of the staff to Uganda and the Delta Waterfowl Research Station, with conservation problems in North America and the use of hand-reared birds for supplementing wild populations, and with problems of ringing geese in the Canadian Arctic. Among the usual interesting collection of photographs of captive and wild birds one of the display of the European Goldeneye is notable.

The report has again been noticed in some detail as there has long been a tendency for papers on the geese and ducks to be excluded from the normal ornithological literature. The maintenance of a trained scientific staff at Slimbridge is yielding results which are now overflowing into other journals, and the increasing contacts between specialists in the Anatidae and other zoologists are a welcome development in which the support of the Nature Conservancy has played no small part. R. C. HOMES

A POPULATION STUDY OF PENGUINS. By L. E. RICHDALE. (*Oxford University Press*, London, 1957). 195 pages, 2 plates. 42s.

IN SPITE OF the remoteness of their breeding-grounds, penguins are becoming one of the better known groups of birds. L. E. Richdale has made a major contribution to this knowledge through his eighteen years' work on the Yellow-eyed Penguin (*Megadyptes antipodes*) in New Zealand, which has resulted in one of the most detailed studies yet made on any avian species. This study is now available in two volumes: the first, *Sexual Behaviour in Penguins* (Kansas, 1951), was concerned with behaviour, while the present volume deals with problems of population.

For an animal with such a long life span—once full maturity is reached, the expectation of life is more than six years, and this figure does not fall appreciably in the next fifteen—a long term study was essential for elucidating the dynamics of population structure. Dr. Richdale's persistence was amply rewarded. By following individuals from year to year he was able not only to obtain detailed data on the survival and movement of individuals, but also to construct a detailed picture of the composition of the community. Especially notable are his data on the influence of age on breeding biology. Although breeding may start in the second year, full breeding maturity is not reached until the fifth. In the intervening years the adolescent birds shift from one breeding-place to another more than adults, breed later, lay smaller eggs and smaller clutches, and do not attain full fertility: full sexual maturity is thus achieved very gradually.

Another section of exceptional interest is the chapter on moulting, where data on its occurrence, duration and consequences are presented. These show that the birds lose about 45% of their initial weight in moulting—though, since they become heavier just beforehand, this loss represents only about 15% of the normal weight.

The Yellow-eyed Penguin differs in a number of respects from the other species which have been studied. It is sedentary, does not breed in large colonies, and the nests are more or less isolated from each other. Although Dr. Richdale was concerned primarily with this one species, he has had opportunity with six others which occurred in the area, and has made a wide study of the literature

on the group. The result is a book filled with a unique collection of data—data which are ably summarized in the 87 tables. The book is so well written that even with this mass of information it is still very easy to read. Many biologists will, however, regret that an author who has made such a remarkable field study and gained such close insight into the life of a species should be so reticent in presenting his views on the significance of the data: more detailed theoretical discussion, placing the facts against a more extensive biological background, would have been a valuable addition to many of the chapters. R.A.H.

THE RING. Edited by DR. W. RYDZEWSKI, 1, Altyre Road, Croydon, Surrey. Nos. 1-11 (October 1954-May 1957). Published quarterly in February, May, August and November. Annual subscription 16s.

TO HAVE ESTABLISHED *The Ring* within the space of three years as a self-supporting bulletin with a circulation in thirty-eight countries is an achievement of which Dr. Rydzewski may justifiably feel proud. Its success is a measure not only of his enterprise and diligence, but also of the value of the service it provides.

Creatures so mobile as birds cannot always be studied within the narrow confines of political boundaries, and the particular merit of *The Ring* is that it provides a practical forum for the regular international exchange of ideas and information relating to ringing. Its influence may be seen already in the improved format of the annual *Report of the Bird Ringing Committee*, and in the new ring sizes now being introduced in this country. Apart from sponsoring this standardized form of report for international adoption, it has conducted an exhaustive survey of the multiplicity of ring types now in use (with some very apposite contributions from the ring manufacturers on the wastefulness of this diversity) and reviewed the various punch-card systems employed to facilitate the analysis of recoveries.

Topics of more general interest include regular progress reports from ringing schemes and observatories in many countries, details of new trapping methods, longevity tables, and selected lists of outstanding recoveries. The regular notices of recent publications devoted to ringing, classified under such headings as "Reports", "Analytical Studies", "Technique", cover many countries and are a valuable source of reference. ROBERT SPENCER

WILDFOWL OF THE BRITISH ISLES. By PETER SCOTT and HUGH BOYD. (*Country Life*, London, 1957). 64 pages, 16 colour plates. 21s.

A STEADILY growing interest in wildfowl is to some extent reflected in the County Bird Reports where prominence is given to the movements and numbers of the Anatidae observed annually on



coastal and inland waters. This book will serve to stimulate that interest, for in addition to the full colour plates it provides useful information for the beginner as well as up-to-date facts for the more advanced students of the subject. The authors describe the work as primarily a picture book presenting the likenesses of all wildfowl so far recorded as having occurred in a wild state in the British Isles, together with three species—Canada and Egyptian Geese (*Branta canadensis* and *Alopochen aegyptiacus*) and Mandarin Duck (*Aix galericulata*)—originally introduced by Man and now established in a feral state.

The plates, arranged like the text in the order swans, geese, ducks, are on the whole exceptionally good, and both the artist—Peter Scott—and the publishers are to be complimented on the high standard of originals and reproduction. It is disappointing, however, to find that, except for a frontispiece of Mallard (*Anas platyrhynchos*), there are no pictures of ducks in flight, because wing-patterns are such a valuable aid to the identification of birds of this group. Finer points of detail such as bill and leg colour are carefully portrayed and even the marked differences of iris colour between male and female of both Red-crested (*Netta rufina*) and European Pochard (*Aythya nyroca*) have not been overlooked. Plate 3—the grey geese—is worthy of perusal by anyone who has some problem of field identification of these “tricky” birds.

Forty-seven of the fifty-eight pages of main text are devoted to an equal number of species, each having a paragraph on Identification, Voice, Range, British Distribution, Nests, and Food. Of necessity this information is very much condensed, but in general the coverage of each species is adequate.

The summaries of each species’ range are an important contribution, but the British breeding distribution of some ducks tends to be vague. In particular, the Shoveler (*Spatula clypeata*) is given as common and increasing, yet there is reason to believe that this species has received a sharp set-back in some southern and eastern counties over the past five years. Details of incubation and fledging periods are disappointing, as the practice of giving authorities is largely discontinued after Bewick’s Swan (*Cygnus bewickii*). Two observers have given fledging periods of the Snow Goose (*Anser caerulescens*) two weeks earlier than is mentioned on page 23; and four authorities have given fledging periods of the Goldeneye (*Bucephala clangula*), whereas on page 51 the remarks are “fledging period not recorded”. Young Teal (*Anas crecca*) are reported as being able to fly at 3½ weeks, a statement which might be worth checking back to its original source as the period seems to be unusually short.

Statements like “when under protection the Mallard may occasionally rear two broods” and, with reference to the Shelduck (*Tadorna tadorna*), that incubation is by the female “apparently, occasionally assisted by the male” lose much of their value when there is no indication of the authority for such reports. With a

bird like the Shelduck which, the authors tell us, nests chiefly in burrows, we should want to know how it was *disproved* that the male had only gone into the nest-site while the female had slipped away from the nest beforehand without meeting her mate. This is but one of the questions the statement poses.

Remarks concerning the origin of Whooper Swans (*Cygnus cygnus*) wintering in Britain are not altogether convincing because there is no information as to whether they are supported by ringing recoveries. Ringing returns published in this journal over the past decade do not furnish a lot of evidence showing that our wintering Whoopers come mainly from Iceland.

Other chapters include "A Guide to Wildfowl Literature" and a "Selected Bibliography", both of which are among the more valuable aspects of this useful little book. ERIC GILLHAM

THE HAWFINCH. By GUY MOUNTFORT. (*Collins "New Naturalist"*, London, 1957). xii + 176 pages, 18 photographs, 32 drawings and maps. 18s.

Few small birds are more elusive and difficult to observe than the Hawfinch and it is therefore with both pleasure and some surprise that one finds what a large amount of careful and first-hand observation is contained in this monograph. The author has not, however, been content therewith, as he might justifiably have been, but has combed the literature for all possible information on every aspect of his subject. Although the live Hawfinch in the field is obviously his real love, he has gone to great pains to make his book complete and spared no trouble in the consultation of other authorities when so-doing. Taxonomic characters, the musculature of the jaws and head, world distribution and the parasites of the Hawfinch are all dealt with, besides its behaviour and ecology in Britain and elsewhere.

Perhaps at times the author's love of his subject gets the better of him, as when he maintains that "In its complicated behaviour and in the elaborate nature of its display the Hawfinch stands alone among European birds". But this is surely a fault on the right side, since without such enthusiasm as it implies Mr. Mountfort would hardly have learned so much about so difficult a bird. One could wish, perhaps, that more attempts had been made to answer some of the queries inevitably aroused by this fascinating account. Why, for example, should the relatively unpersecuted Hawfinch show, as it apparently does, greater and more consistent fear of man than even such relentlessly hunted species as the Bullfinch, Jay and Woodpigeon? The reviewer would consider the behaviour instanced as parental discipline (pp. 90-91) to be nothing more than simple re-directed aggression.

In conclusion one can say that no Hawfinch addicts should fail to get this book. They may be sure that if they are lucky enough to learn any fact about the bird that is not therein, their observations will almost certainly be previously unknown. D.G.

## NOTICE TO CONTRIBUTORS

*British Birds* publishes material dealing with original observations on the birds of Britain and Western Europe, or where appropriate, on birds of this area as observed in other parts of their range. Except for records of rarities, Papers and Notes are normally accepted only on condition that the material is not being offered to any other journal. Photographs (glossy prints showing good contrast) and sketches are welcomed. Proofs of all contributions accepted are sent to authors before publication. After publication 20 separates of Papers are sent free to authors; additional copies, for which a charge is made, can be provided if ordered when the proofs are returned.

Contributors are asked to observe the following points, attention to which saves the waste of much editorial time on trivial alterations:

1. Papers should be typewritten with double spacing, and on one side of the sheet only. Shorter contributions, if not typed, must be clearly written and with similar spacing. Failure to help in this way may result in delays to publication.

2. Notes should be worded as concisely as possible, and drawn up in the form in which they will be printed, with signature in block capitals and the writer's address clearly written on the same sheet. If more than one Note is submitted, each should be on a separate sheet, with signature and address repeated. In the case of rarity records, any supporting description which is too detailed for publication should be attached separately.

3. Certain conventions of style and lay-out are essential to preserve the uniformity of any publication. Authors of Papers in particular, especially of those containing Systematic Lists, Reference Lists, Tables, etc., should consult the ones in this issue as a guide to general presentation. English names of species should have capital initials for each word, except after a hyphen (e.g. Siberian Thrush, Yellow-headed Wagtail), but group terms should not (e.g. thrushes, wagtails). English names are those used in *The Handbook of British Birds*, with the exception of the changes listed in *British Birds* in 1953 (vol. xlii, pp. 2-3). The scientific name of each species should be given (in brackets and underlined) immediately after the first mention of the English name. Sub-specific names should not be used except where they are relevant to the discussion. It is sometimes more convenient to list scientific names in an appendix. Dates should take the form "1st January 1955" and no other, except in Tables where they may be abbreviated to "1st Jan.", "Jan. 1st", or even "Jan. 1", whichever most suits the lay-out of the Table concerned. It is particularly requested that authors should pay attention to Reference Lists, which otherwise cause much unnecessary work. These should take the following form:

TUCKER, B. W. (1949): "Species and subspecies: a review for general ornithologists". *Brit. Birds*, xlii: 129-134.

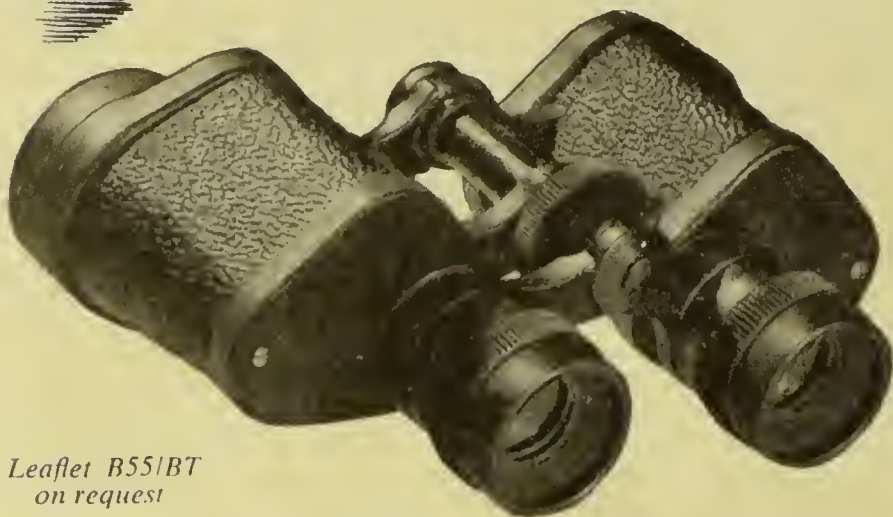
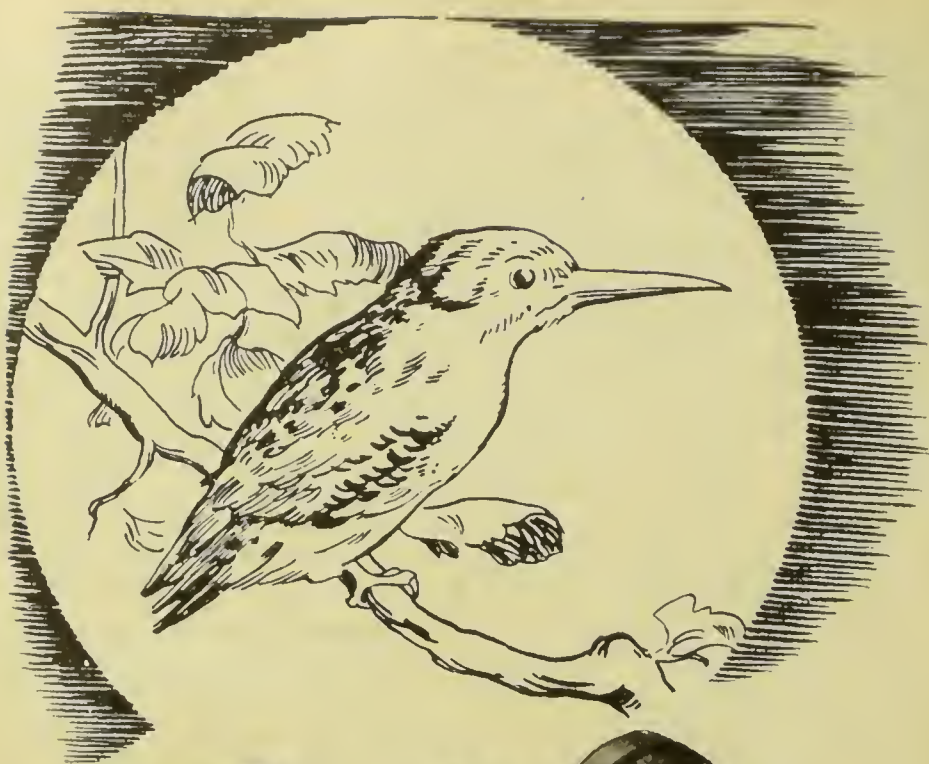
WITHERBY, H. F. (1894): *Forest Birds: Their Haunts and Habits*. London. p. 34.

Various other conventions concerning references, including their use in the text, should be noted by consulting previous examples.

4. Tables should be numbered with Roman numerals, and the title typed above in the style used in this issue. The title and any headings within the Table should not be underlined, because this sometimes makes it difficult for the Editor to indicate the type to be used. It is most important that the lay-out of each Table should be carefully planned with an eye to its final appearance; above all, it should be borne in mind that Tables must either fit into the width of a page, or be designed to fit a whole page lengthways. All Tables should be self-explanatory.

5. Figures should be numbered with Arabic numerals, and the captions typed on a separate sheet. All line-drawings should be in Indian ink on good quality drawing paper (not of an absorbent nature) or, where necessary, on graph paper, but this must be light blue or very pale grey. It is best if maps, graphs, etc., are drawn twice the size of the final reproduction (ideally, therefore, for the normal 4" width the original should be 8" wide); sketches of birds, however, should be only slightly larger than the size at which it is intended they should appear. It is always most important to consider how each drawing will fit into the page. The neat insertion of lettering, numbers, arrows, etc., is perhaps the most difficult part of Indian ink drawing and, unless he has had considerable experience of this kind of work, an author should seek the aid of a skilled draughtsman. The publishers regret that, owing to rising costs, it will in future be only in exceptional cases that they can undertake to have lettering inserted.





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# BRITISH BIRDS



SEPTEMBER 1957

THREE SHILLINGS



# BRITISH BIRDS

AN ILLUSTRATED MONTHLY MAGAZINE

Edited by

E. M. NICHOLSON

W. B. ALEXANDER

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I. J. FERGUSON-LEES

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## CONTENTS OF VOLUME L, NUMBER 9, SEPTEMBER 1957

---

	PAGE
Bee-eaters breeding in the Channel Islands in 1956. By Mrs. A. le Sueur	361
The Little Ringed Plover in Great Britain, 1954-56. By E. R. Parrinder	365
The breeding of the Storm Petrel. By Peter Davis. Part II—The chick stage. Photographed by Mrs. Peter Davis (plates 49-51) ...	371
Photographic studies of some less familiar birds. LXXXIII—Sooty Tern. Photographed by the Hon. M. W. Ridley and John Markham (plates 52-55). Text by I. J. Ferguson-Lees ... ..	385
Field-notes on white feathering at the base of the bill and white under tail-coverts in the Tufted Duck. By E. H. Gillham ... ..	389

### Notes:—

Impressions left by birds striking glass windows (E. J. M. Buxton) (photographed by Gilchrist Studio, Holborn, and Miss H. S. Houghton—plate 56) ... ..	393
An unusual tit's nest, probably of Blue Tit (Noel Currier, Michael Howarth and Alfred Hazelwood) ... ..	393
Pallas's Grasshopper Warbler at Fair Isle (Kenneth Williamson) ...	395
Lesser Grey Shrike on Foula, Shetland (C. K. Mylne) ... ..	397
Linnets nesting socially in tufts of the Common Rush (Ronald Driver)	397

### Letters:—

Science and the bird-watcher (G. L. Scott and D. K. Ballance; A. W. Boyd) ... ..	398
--	-----

### Notices:—

The XIIth International Ornithological Congress ... ..	400
Ceremony on Heligoland ... ..	400

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Cover photograph by Harold R. Lowes: Sand Martin (*Riparia riparia*) at nest-hole



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## BRITISH BIRDS

### BEE-EATERS BREEDING IN THE CHANNEL ISLANDS IN 1956

By FRANCES LE SUEUR

LATE in the evening of 6th July 1956, R. Noble saw two birds flying around and perching on telegraph wires near Fort Albert, Alderney. He had good views of them for about fifteen minutes and was satisfied that they were Bee-eaters (*Merops apiaster*). He returned several times during the following days but did not see the birds again, nor did he hear of anyone else who had seen them. He therefore presumed that they were passing through on migration.

On 25th July, however, Richard Harrison, who was camping in Alderney with a party from Ackworth School, Yorkshire, was travelling by bus along the main road past Fort Albert when he saw three Bee-eaters and some Starlings (*Sturnus vulgaris*) sitting on the telegraph wires. They were still there when he walked back. In the afternoon he returned and was able to watch the birds for some time. They were sitting close together on the cross-bar of the goal-posts at the eastern end of the football pitch below Fort Albert. Three times, while he watched, a bird flew to the low sand cliff near-by and perched against a small round hole about five feet from the ground. The bird looked round each time and then disappeared into the hole. Harrison returned to the camp and took N. V. Mendham, the master-in-charge, and S. Haworth back with him to the football pitch. They stayed about an hour but did not see the bird, so they inspected the hole. There were a few traces of insect matter below it. They probed it with a stout wire and found it to be fairly straight, horizontal and about 3' 6" deep. There were pieces of chitin on the wire when it was withdrawn. Underneath the goalposts they found a good deal of insect material in the form of loose pellets. As they returned to the camp they saw the birds sitting on the tops of bushes or on old barbed wire posts on the braeken-covered slope south of Fort Albert. On 26th July Harrison returned with other members of the camp. The birds were once again on the goalposts, all seemed



brightly coloured and all had long tail feathers. One bird was present on 27th July, but gales prevented further observation.

Some members of the Junior Naturalists' Club of London were also camping in Alderney and they reported Bee-eaters flying over their camp, or feeding over the short scrub and bushes near it, in Barrack Master's Lane, about five hundred yards from the nest area, from 2nd to 7th August (A. Dowland, A. Mayhew, F. Shearer, Mrs. I. Doncaster, Miss J. Palmer). No member of the Club saw them after this and they suggest that the birds left the island about then. The maximum number of Bee-eaters recorded was three, but more often only two were noted together. On one occasion, 6th August, a bird was seen near the gannetry at the opposite end of the island.

W. D. Hooke and S. F. Hibbs were in Alderney on 6th August, a day of continuous heavy rain. No birds were at the nest site or near it, but later in the afternoon they saw three Bee-eaters sitting on an electric power cable near Barrack Master's Lane.

A. le Sueur and I were in Alderney at the end of August. We searched for the birds without success; nor could we find anyone who had seen them since the beginning of the month. The weather had been poor since July with several severe gales and prolonged rainstorms. None of the above reports contains references to young birds and as there was not sufficient information to confirm breeding we decided to excavate the nest. A vertical section through the site is given in the diagram (Fig. 1). The site was in full view of a main road and within a few yards of, though not visible from, a much used footpath. The hole was in sandy clay 4' 6" below the top of the cliff though grass was hanging over for more than a yard. Above the cliff, the land gradually sloped upwards in a bracken scrub and below it, levelled out onto the football pitch. We knew that several people had poked down the tunnel with arms, wires and reeds, so unfortunately we took no notes of the actual cliff face round the hole. However, H. A. R. Cawkell who saw the Bee-eaters breeding in Sussex in 1955 (Barham, Conder and Ferguson-Lees, 1956) has since described to us the appearance of the twin grooves scraped by the bird's claws at the tunnel-entrances, and we recall commenting at the beginning of our excavation on the peculiar way the people who had poked down the hole with wire must have held it in order to produce the marks underneath. We now realise that these marks were made by the birds when they were hanging against the hole as Harrison described. There were now no droppings or insect remains underneath. As soon as the tunnel itself began, the hole was circular with a three-inch diameter in sharp contrast to the holes of Sand Martins (*Riparia riparia*) twenty yards away. The tunnel was almost horizontal and practically straight, the slight downward slant and the turn to the left after 1' 8" being due to root and stone obstructions. At 1' 8" the hole had a slightly elliptical vertical section, 3" wide and 2½" high, but by 2' 3" it

was obviously elliptical, being  $3\frac{1}{2}$ " wide and  $2\frac{1}{2}$ " high, and it remained like this until the entrance of the nest chamber was reached at 2' 11". Most of the nest chamber, which was 11" by 9" and  $3\frac{5}{8}$ " high, was to the left of the entrance hole. The floor of the chamber was covered in insect-remains to a depth of  $1\frac{1}{8}$ ",

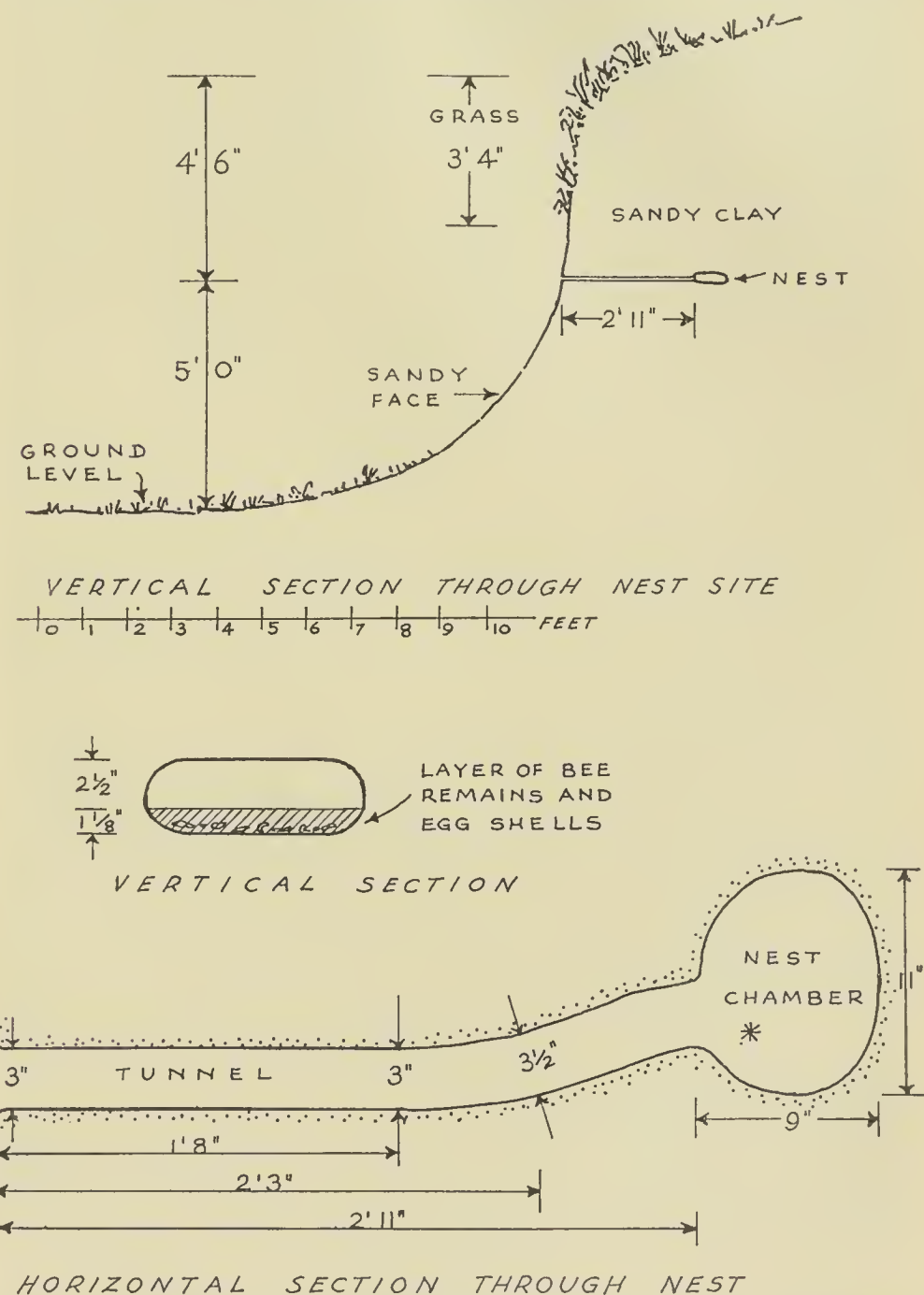


FIG. 1—DIAGRAM TO SHOW DIMENSIONS AND POSITION OF NEST OF BEE-EATERS (*Merops apiaster*): ALDERNEY, CHANNEL ISLANDS, 1956  
The asterisk in the nest chamber indicates the position of the remains of the long-dead Sand Martin (*Riparia riparia*) (see page 364).

leaving only  $2\frac{1}{2}$ " free space above. Except for the wing-feathers of a long-dead Sand Martin sticking through it, the top surface of the insect remains was perfectly level right to the edges with no depressions or mounds anywhere. The dead Sand Martin was slightly to the right of the entrance hole; only the skeleton and a few feathers were left and from the general state it would appear safe to say that the bird died before 1956. When the insect remains were being scooped up and put in a cellophane bag a fairly large quantity of eggshells was found in the bottom layer. There was no lining material of any kind. The whole nest contents were sent to the British Trust for Ornithology for analysis.

The B.T.O. passed the contents to D. F. Owen of the Edward Grey Institute, Oxford, who analysed them and reported that the insect remains were almost entirely the hard parts of bumble bees (*Bombus* spp.) with a few pieces of beetle (including *Amphimallon solstitialis*) and also one or two wasps (*Vespa* spp.). He found no sign of Odonata. There were no parasites. He confirmed that the egg-shells were Bee-eater's.

From the above information the following conclusions can be drawn:—

- (1) A pair of Bee-eaters bred in Alderney in 1956.
- (2) Several eggs were laid and all were hatched unless the parent birds removed the addled ones.
- (3) The large amount of food remains in the nest indicates that the young were reared.
- (4) The young left the nest, as no remains of dead ones were found in it.
- (5) No information is available about the date of breeding nor of the fate of the young after leaving the nest. The adults were seen only between 6th July and 7th August.
- (6) They used an old Sand Martin burrow and did not make the initial excavation of the tunnel and nest chamber themselves. There is no other means of explaining the dead Sand Martin. Also the elliptical shape of the tunnel for the greater part of its length was typical of Sand Martins' burrows. The Bee-eaters enlarged the entrance and probably the nest chamber.

No more information is at present available. I should be pleased to receive additional notes.

Bee-eaters have been recorded on only four previous occasions in the Channel Isles, one in 1892 and one in 1904 in Jersey, two in May 1917 in Alderney and one in October 1924 in Guernsey (Dobson, 1951). Unfortunately all but one were shot.

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- DOBSON, R. (1951): *The Birds of the Channel Islands*. London.  
BARHAM, K. E. I., CONDER, P. J., and FERGUSON-LEES, I. J. (1956): "Bee-eaters nesting in Britain, 1955". *Bird Notes*, xxvii: 34-43.



## THE LITTLE RINGED PLOVER IN GREAT BRITAIN, 1954-56

By E. R. PARRINDER

THE LAST report on the spread of the Little Ringed Plover (*Charadrius dubius*) in Britain was published in 1954 (*antea*, vol. xlvii, pp. 198-203) and covered the years 1951-53. This present account brings the story up to the end of 1956.

In 1953, about 54 pairs of Little Ringed Plovers were located in 16 counties. In the next two years there was little apparent change in the total population, but birds nested for the first time in Oxfordshire and Cheshire in 1954 and in Leicestershire in 1955. In 1956, the total number increased to over 70 pairs, of which at least 50 were proved to have nested. About half of this number was still at the gravel pits around London, but there was also an increase to the north; nesting took place in Bedfordshire for the first time since 1951 and in Huntingdonshire for the first time since 1953; in the Midlands, three pairs colonized Nottinghamshire and three pairs nested in Derbyshire, after a lapse of five years.

Breeding has now occurred in every county south of the Tees and east of a line from Morecambe Bay to Southampton, except for Lancashire, Warwick, Rutland and Norfolk. West of this line (which in the previous report was drawn from Hull to Southampton) breeding has occurred only in Gloucester, but in recent years birds have been recorded on passage from Worcester, Somerset, Devon and Cornwall; and on 17th September 1953 four were seen at the North Bull Sanctuary, Dublin (*Irish Bird Report*, 1953, p. 10)—the first and still the only Little Ringed Plovers recorded in Ireland. In the north, the first sight record for Lancashire was at Leigh Flash in May 1953 (*N.W. Naturalist*, vol. 3 new series, p. 243, *per* C. Oakes) and for Durham by a brickfield pond in May 1954 (*per* G. W. Temperley). South of Durham, Norfolk is the only East Coast county with no breeding records, although birds are seen regularly on passage and in 1955 a bird displayed and made serapes in territory behind the beach at Cley for some weeks, but apparently failed to attract a mate (*Norfolk Bird Report*, 1955).

Nearly all the breeding sites are still at gravel pits or similar areas of stony waste land and the rate of increase is no doubt slowed down by the heavy disturbance to which such places are often subjected. Many of the details which follow give an indication of poor breeding success, e.g., in Essex in 1955 only eight out of 17 clutches hatched and one pair nested four times, each time unsuccessfully. Nevertheless, there are a number of instances of genuine double broods.

The spread to new districts is probably caused more by old sites becoming unsuitable than by competition for nesting sites and it

is now worth-while looking for Little Ringed Plovers on flat, stony ground with shallow pools almost anywhere in England.

I am indebted to the observers named and to the editors of local reports who have supplied me with information.

#### HAMPSHIRE

Nested 1952.

1954—One at Farlington Marshes on 8th May and 4th and 14th August (*per* E. Cohen).

1955—A pair on shingle flats of Southampton Water from 3rd May-21st July; behaviour strongly suggested nesting but no proof obtained (New Forest Ornithologists' Club *per* E. Cohen).

1956—A pair again by Southampton Water, in May and June, but no evidence of nesting (*ibid.*).

#### SUSSEX

Has nested annually since 1949.

1954—Six pairs, out of seven present, attempted to nest, but only six young are believed to have reached the free-flying stage (*Sussex Bird Report*, 1954).

1955—Three pairs nested and hatched young (*Sussex Bird Report*, 1955).

1956—At the original locality, two pairs were present during the breeding season, but only one young appears to have been raised. A pair raised three young at each of two other localities, one in a new area (*per* D. D. Harber).

#### KENT

Nesting proved in most years since 1947.

1954—In the London Area, three out of five pairs which attempted nesting hatched out their young (*London Bird Report*, 1954). Elsewhere, single pairs were found in three localities and young were hatched at two (*Kent Bird Report*, 1954).

1955—A pair nested at the original gravel pit in the London Area, but the eggs were stolen. Three out of four pairs present in another area are known to have bred. At a third locality, a clutch of three in a shallow depression in the middle of a einder track later disappeared (*London Bird Report*, 1955). Outside the London Area, two out of four pairs at different localities hatched young (*Kent Bird Report*, 1955).

1956—In the London Area, a pair bred at one site (W. J. Irwin *per* E. H. Gillham) and at another between two and five birds were present in April-June, but no nest was found (Mrs. W. I. Brewer). Outside London, six pairs, at three sites, hatched out young, but it is not known how many flew (*per* E. H. Gillham).

#### SURREY

Nesting proved in most years since 1950.

1954—Three, possibly four, pairs present and three broods are believed to have reached the free-flying stage (*Surrey Bird Report*,

1954). A juvenile ringed on 6th June 1954 was recovered (shot?) at St. Bazeille, Lot et Garonne, on 29th March 1955.

1955—Four pairs nested, at three sites—two being new localities (*Surrey Bird Report*, 1955).

1956—Three pairs nested, but only four young are known to have flown (*per* Miss Phyllis Bond and H. Medhurst).

#### ESSEX

Has nested annually since 1947.

1954—Three pairs, out of five present at three localities, are known to have bred, but apparently only four young flew (*London Bird Report*, 1954).

1955—At least ten pairs were present, at four gravel pits, and nine pairs are known to have bred. Breeding success, however, was low and there were many repeat clutches: of 17 clutches found only eight hatched and it is probable that less than 20 young flew; one pair nested four times, each time unsuccessfully. There were three certain cases of genuine double broods (*London Bird Report*, 1955).

1956—Six pairs summered, at four sites, and five first clutches are known to have hatched; a number of fledged young were seen, but the total success is not known. One pair laid a second clutch after successfully rearing its first young (J. L. F. Parslow). In another district, a pair stayed all summer but no nest was found (*per* H. Medhurst).

#### HERTFORDSHIRE

Has nested intermittently since 1938.

1954—One pair bred at a gravel pit (*London Bird Report*, 1954).

1955—Three or four pairs summered, at three sites; two pairs are known to have nested (*London Bird Report*, 1955).

1956—At least seven pairs are known to have nested, out of ten pairs staying the summer (J. L. F. Parslow; *per* H. Medhurst).

#### MIDDLESEX

Nested annually 1944-1953.

1954—No proof of nesting, for the first time since 1944, but birds were seen at five localities in the breeding season; at Perry Oaks sewage farm up to four were seen almost continuously from 24th March to 19th September (*London Bird Report*, 1954).

1955—One to four again frequented Perry Oaks sewage farm from 27th March to 26th September and breeding near-by seems likely but was not proved. Only one was seen at the Thames Valley gravel pits; a result, almost certainly, of a lack of observation rather than of birds. Elsewhere in the county, one out of two pairs summering at a gravel pit attempted to nest (*London Bird Report*, 1955).

1956—About five pairs located but attempted nesting proved for only one. One to five birds again seen at Perry Oaks sewage



farm from 30th March to 3rd October (many observers *per* H. Medhurst).

## BERKSHIRE

Nesting proved in most years since 1947.

1954—Two pairs bred at gravel pits in the Kennet Valley. Birds were seen at Ham sewage farm throughout the summer, but conditions were never suitable long enough for breeding (*Oxford Orn. Soc. Report*, 1954).

1955—Three pairs present at gravel pits but only one proved to breed. A pair nested at Ham sewage farm and reared four young (*Reading Orn. Club Report*, 1955, and J. Field).

1956—A pair nested at each of two gravel pits and birds were seen in May at two others (*per* K. E. L. Simmons). Breeding was not proved at Ham sewage farm but seems highly probable; birds were present all summer and two flying young were seen from 7th to 25th July (J. Field).

## OXFORDSHIRE

1954—A pair nested on an islet in a gravel pit; the first clutch was stolen by collectors and the next was flooded, but two or three young were fledged from the third attempt. This was the first occurrence in the county (*antea*, vol. xlviii, pp. 176-177).

1955—One or two seen at last year's site in early spring, but apparently did not stay (B. Campbell).

1956—Frequented former breeding site up to early July, but higher water level apparently prevented nesting (W. D. Campbell).

## BUCKINGHAMSHIRE

Has nested occasionally since 1949.

1954—No nesting records.

1955—A pair probably bred at a new locality in the north of the county (J. Field).

1956—One to three present April-July at the 1955 site; breeding suspected but not proved (J. Field).

## SUFFOLK

Nested annually 1948-1953.

1954—No records.

1955—Two at Breydon Water on 7th August were the only birds recorded (*per* F. K. Cobb).

1956—No breeding records (*per* F. K. Cobb).

## CAMBRIDGESHIRE

Has nested annually since 1952.

1954—One pair bred at a gravel pit. At another pit two pairs were seen in May but several clutches later disappeared; however, the presence of two juveniles in August suggests that at least one pair was finally successful (*per* A. E. Vine).

1955—The main pit was unsuitable, but a pair bred at another

and breeding was suspected at a third. In the Fens, a pair was seen displaying over the mud edge of a pool in a grass field (*ibid.*).

1956—Three pairs hatched out young and two others may have nested. As usual, birds were seen frequently at Cambridge sewage farm and there were 15 there on 21st and 22nd July (*ibid.*).

#### BEDFORDSHIRE

Nested 1951.

1954—No evidence of breeding; two were seen at a gravel pit on 30th March, and a juvenile at Dunstable sewage farm from 26th August to 14th September (*Bedfordshire Naturalist*, 1954).

1955—Two at Bedford sewage farm on spring passage (F. C. Gribble).

1956—Of two pairs at a gravel pit, one had free-flying young on 5th July and the other newly hatched chicks on 15th July; on 29th July a pair with two flying young was found at another pit. Single birds were seen on passage at Bedford and Dunstable sewage farms (*per* F. C. Gribble).

#### HUNTINGDONSHIRE

Nested 1952.

1954—Birds were seen at two gravel pits in May, but there was no evidence of nesting (C. F. Tebbutt).

1955—No records.

1956—A pair seen at a gravel pit during May disappeared in June when the possible nesting ground was flooded (C. F. Tebbutt).

#### NORTHAMPTONSHIRE

Nested 1953.

1954—Two pairs spent the summer at a gravel pit and one is thought to have nested on an inaccessible islet. Passage birds were seen in spring and autumn at Ecton sewage farm (*per* A. J. B. Thompson).

1955—Two pairs summered; a clutch of 4 eggs found at the original gravel pit on 7th May was subsequently washed away by a heavy storm; on 25th July two adults were seen with two juveniles only just capable of flight. Again passed through Ecton sewage farm in spring and autumn, maximum 9 juveniles on 14th September (*Mid-Northants. Bird Club Report*, 1955—*per* A. J. B. Thompson).

1956—Two pairs at the original pit from 15th April to 27th June but no proof of breeding (*per* A. J. B. Thompson). One out of two pairs at another gravel pit is known to have hatched four young (*per* R. Felton).

#### GLOUCESTERSHIRE

Nested 1953.

1954—Two pairs nested at the 1953 locality and are believed to have reared young successfully (*per* C. M. Swaine).

1955—Only one pair seen at previous locality; the first two clutches were lost, at least one to collectors, and the third and last

attempt was disturbed by bathing. Breeding was suspected, but not proved, at another site (*ibid.*).

1956—None seen.

#### STAFFORDSHIRE

Nested 1952.

1954—One or two at two localities on passage (*West Midland Bird Report*, No. 21).

1955—None seen.

1956—Up to three at a gravel pit in May, but no evidence of breeding (*per* J. Lord).

#### LINCOLNSHIRE

Has nested annually since 1950.

1954—Nests of three pairs were found at a gravel pit on 30th May, but only one young was found on a later visit (*Lincolnshire Bird Report*, 1954).

1955—One, possibly two, pairs bred at a gravel pit. At another, new, site a pair nested and at least three other adults were present (*ibid.*, 1955); a young bird ringed on 24th June was found dead on 6th October 1956 at Cransley, 24 miles south-west (A. E. Vine).

1956—Certainly one, probably two, pairs bred at a gravel pit and a nest was found at another, new, site; the second site mentioned under 1955 was not used, probably because of disturbance by pit machinery (R. May and R. Driver *per* R. K. Cornwallis, and A. E. Vine).

#### LEICESTERSHIRE

1954—Eye Brook Reservoir, one on 8th August (*per* R. Hickling).

1955—Two nests were found at a gravel pit—the first breeding record for the county. Four young are believed to have fledged from these first clutches, and second clutches were laid in about the same positions. It was strongly suspected that only three adults were present (*antea*, vol. xlviii, p. 543).

1956—Two pairs bred at the 1955 site (*per* R. Hickling).

#### NOTTINGHAMSHIRE

1954—One or two birds at a gravel pit in May and June (*per* J. M. McMeeking).

1955—One to four birds at a gravel pit in June, July and August (one date each) (*ibid.*).

1956—First nesting in county: two pairs bred at a gravel pit, but only one chick is known to have survived, and another pair probably bred at a pit 30 miles away (*antea*, vol. xlix, p. 453).

#### DERBYSHIRE

Nested 1950.

1954—No records.

1955—Two at a sewage farm on 16th and 17th April (*Derbyshire Orn. Soc. Report*, 1955).

1956—Three pairs nested at gravel pits (*per* W. K. Marshall).



## CHESHIRE

1954—A pair bred, for first time in county, adjacent to shallow pools; the nest was found on 13th July, but both eggs and birds had disappeared by 24th July (*anlea*, vol. xlviii, p. 176).

1955—A wader seen in flight on 8th May, and heard calling, was probably this species (*per* A. W. Boyd).

1956—No records.

## YORKSHIRE

Has nested annually since 1947.

1954—Three pairs nested in central and one pair in south Yorkshire and there were possibly two pairs in another area (*Y.N.U. Orn. Report*, 1954).

1955—At least three broods were produced in one area and birds were seen in two other areas (*ibid.*, 1955—*per* R. Chislett).

1956—Seven pairs nested, at three sites, and odd birds were seen elsewhere (*per* R. Chislett).

## THE BREEDING OF THE STORM PETREL

By PETER DAVIS

(*Field Studies Council*)

### PART II

(*Continued from page 101*)

(Plates 49-51)

IN the first half of this paper (*antca*, pp. 85-101) I summarized some of the results of three seasons' work on the Storm Petrel (*Hydrobates pelagicus*) at Skokholm, Pembrokeshire, dealing chiefly with the pre-egg and egg stages of the reproductive cycle of this pelagic bird. Reference was made to previous work on this species carried out by Loekley (1932); methods of investigation were outlined; and I also discussed the problems of the age at which the Storm Petrels breed, and of the "ineffective" birds which occupy burrows but which for various reasons have no breeding responsibilities. In the introductory sections I described the burrows and discussed the question of birds returning to the same burrows in successive years.

This second part covers the life of the chick, thus completing the review of the period which the species spends on land.

### The Chick Stage

This section deals chiefly with parental attentiveness, the size and frequency of feeds, and the development of the fledgling. To

put these matters into their correct perspective, a table of fledging-periods precedes them.

#### THE FLEDGING-PERIOD

Table V gives the fledging-periods of thirty-two chicks, calculated to the nearest twelve hours.

TABLE V—THE FLEDGING-PERIOD OF THE STORM PETREL (*Hydrobates pelagicus*)

Burrow No.	Year	Chick hatched	Chick departed p.m. night	Fledging period (days)
1	1954	24 July	28 Sept.	67
5		11 Aug.	9 Oct.	60
9		21 July	19 Sept.	61
11		31 July	1 Oct.	63
12		11 Aug.	11 Oct.	62
14		8 July	6 Sept.	61
16		15 Aug.	16 Oct.	62.5
28		13 Aug.	13 Oct.	62
33		25 July	27 Sept.	64.5
1	1955	28 July	26 Sept.	61
5		13 Aug.	17 Oct.	60
6		5 Aug.	3 Oct.	60
8		7 Aug.	6 Oct.	61
9		23 July	17 Sept.	56.5
11B		10 Aug.	12 Oct.	64
12B		20 July	27 Sept.	61
14		27 July	26 Sept.	61.5
17A		9 Aug.	9 Oct.	62
17B		7 Aug.	10 Oct.	64.5
19		7 Aug.	9 Oct.	63.5
20		5 Aug.	9 Oct.	66
28		29 July	29 Sept.	62
33		1 Aug.	4 Oct.	65
6	1956	31 July	5 Oct.	67
11B		4 Aug.	3 Oct.	61
12B		6 Aug.	4 Oct.	60
15		6 Aug.	7 Oct.	63
17B		24 July	28 Sept.	67
20		9 Aug.	20 Oct.	73
24		26 July	1 Oct.	68
28		2 Aug.	28 Sept.	58
33		4 Aug.	28 Sept.	56

Average fledging period  $62.8 \pm 3.5$  days

Lockley's six fledging-periods ranged from 54 to 68 days, with an average of 61 days.

#### BROODING OF THE CHICK

Table VI presents the information obtained from twenty-five nests concerning brooding of the chick by its parents. The sexes are indicated where known, otherwise the presence of an adult bird is shown by a cross. Symbols in brackets show where the adult was sitting alongside the chick, and not covering it.

TABLE VI—BROODING OF THE CHICK OF THE STORM PETREL (*Hydrobates pelagicus*)

Burrow No.	Year	Adult present on day												Later
		1	2	3	4	5	6	7	8	9	10	11	12	
5	1954	X	X	X	X	X				X	X			(♂, 13th)
9		♂	♀	♀	♂	♀				♂				
11		♂	♀	♀	♂	♀	♂	♀		♀		(♀)	(♀)	
14		X	X	X	X	X	X		X		X			
16		X	X	X	X	?	X		X	X				
28		♀	♂	♀	♂	♂	♀		♀	♂	♀	♂		(♀, 13th)
8	1955	X	X	X	X	X		X						(♀, 13th)
9		♂	♂	♀	♂	♀	♂	♀						
11B		X	X	X	X	X								
12		X	X	X	X	X	X	X			(X)			
14		♂	♀	♂	♀	♀	♀	♂	X					
17A		♂	♀	♂	♀	♂	♀				♂			
19		♀	♂	♀	♂	♀	♂							
24		X	X	X	X	X	X			X				
28		♂	♂♀	♂	♀	♀	♀			♀				
33		♀	♂	♀	♂	♀	♂	♀	♂					
6	1956	X	X	X	X	X	X	X	X	X	X			(X, 16th) (X, 13th)
11B		X	X	X	X	X	X		X					
12B		X	X	X	X	X	X			X				
15		X	X	X	X	X	X					X	(X)	
17B		X	X	X	X	X	X		X		X			
20		X	X	X		X		X		X				
24		X	X	X	X	X		X	X			X	X	
28		X	X	X	X	X	X	X	X					
33		X	X	X	X	X	X	X						

It will be seen that in nineteen of these nests the chick was not left until the seventh day, and in only one instance was it left before the sixth day. This differs to a surprising degree from Roberts' (1940) findings with Wilson's Petrels (*Oceanites oceanicus*), whose young were not brooded after the second day. The temperature-regulating mechanism of Wilson's Petrel chicks began to function at the age of 48 hours, coinciding with the end of brooding. It may be that this mechanism functions later in the Storm Petrel, but I have not cared to follow Roberts' rather drastic method of collecting data on this subject, by inserting a thermometer into the body-cavity immediately after death. More delicate methods of reading the temperatures of the chicks were not available.

At the nine nests where the sexes of the brooding adults could clearly be distinguished, males were present on 34 days and females on 38 days. There were 56 one-day shifts, 5 two-day shifts, and 2 three-day shifts, including one day when both parents were covering the chick.

I have never found an adult in the nests after the 16th day, but Lockley once found a parent present when the chick was 33 days old.

#### THE FREQUENCY OF FEEDING

The chicks were first weighed at twenty-four hours old, then every forty-eight hours until the first interval in brooding, when



twice-daily weighings commenced. Since brooding was often resumed after the first interval, it was possible to establish that, during the day, the young bird received small feeds, sufficient to maintain its morning weight, although the main feed was given on the return of the foraging bird at night. There was a fairly steady rise in weight during brooding, and feeding appeared to be very regular and frequent at first. The only gaps I have recorded were in exceptional circumstances, such as the single occasion when both birds remained together in the nest, and neither was able to collect food.

The frequency of feeding after the end of brooding has been analysed for a sample of twenty nests. The results of this analysis are summarized in Table VII.

TABLE VII—FREQUENCY OF FEEDING AT 20 NESTS OF THE STORM PETREL  
(*Hydrobates pelagicus*)

Nights	11-20	21-30	31-40	41-50	51-60
Nights available	200	200	200	200	193
Feeds given	186 (93%)	168 (84%)	170 (85%)	166 (83%)	128 (66%)

The important features emerging from this table are the high frequency of feeds in the early part of the chick's life, and the sharp fall towards the end of the fledging-period.

Intervals of more than one night between feeds are comparatively rare until the chick is about 50 days old. Many of the gaps may be caused simply by the failure of both parents to find food, or by both having travelled too far from the colony in search of food. I can suggest no adequate explanation for the few longer gaps of up to three nights, nor for the fast of six nights undergone by one chick between its 46th and 52nd days. My records give little indication that weather-conditions play an important part in preventing the parents' return, with the possible exception of gales of force 8 (37 knots) or more. There were only two sustained overnight gales of this strength whilst I had a reasonable number of chicks under observation; on 5th-6th October 1955 only one chick out of eight was fed, and on 27th-28th September 1956 only two out of nine. Moonlight has no inhibiting effect on visits, such as that described by Ralphs (1956) for the Manx Shearwater (*Procellaria puffinus*).

After the 50th day, feeding gradually becomes more irregular, and gaps of up to four or five nights are not uncommon in the final stages. There seems to be an increasing "loss of interest" in the chick, and some parents cease to visit the nest before the chick has departed, though in general it is not possible to speak of a "desertion-period" in this petrel. The intervals between the last feed and final departure of the chick at thirty-two nests were: none at four nests, one night at eleven nests, two nights at nine nests, three nights at three nests, four nights at three nests, five nights at one nest, and seven nights at one nest. The two longest

periods were both at nests where the chick apparently had difficulty in finding its way to the open air; in one a long and tortuous passage, and in the other a vertical climb of some six inches from the floor of the burrow to the tiny exit, had to be negotiated.

At three burrows I was able to discover, by means of lattices, that the nest was visited on one occasion after the chick had gone.

#### THE SIZE OF FEEDS

The weighings at 1730-1800 and at 0800-0830 hours\* showed clearly the occasions when the chick had been fed during the night. Even the smallest feeds, resulting in no increase, or at times a small loss of overnight weight, appeared as a flattening of the downward curve when the results were plotted on graph-paper.

This method of detecting feeds proved most satisfactory, but gave, in itself, no indication of the actual amount of food received. For this reason I undertook, during the 1956 season, a series of some forty weighings at midnight, in addition to those of the early evening and morning. These records established that there was a fairly constant relationship between the weight of feeds and the rate of overnight increase, and made it possible to work out the actual size of feeds represented in my earlier growth-curves. The chart derived from the results of the midnight weighings, and upon which my calculations of feed-size are based, is reproduced as Fig. 2.

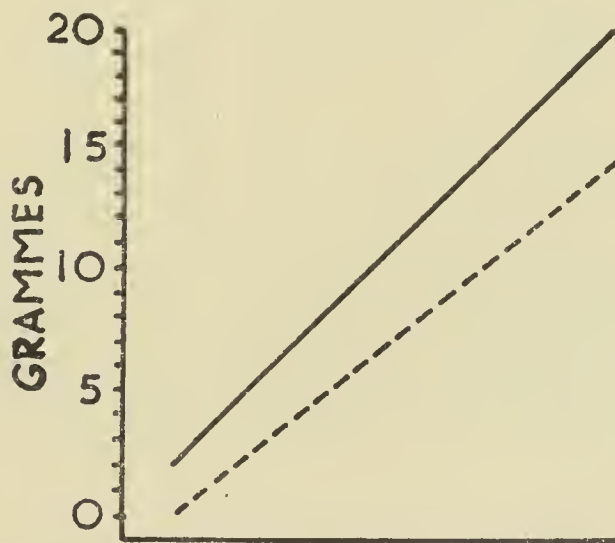


FIG. 2—RELATIONSHIP BETWEEN ACTUAL SIZE OF FEEDS AND APPARENT INCREASE IN WEIGHT IN STORM PETREL (*Hydrobates pelagicus*) CHICKS FROM 1730 TO 0800 G.M.T.

The unbroken line represents the actual weight of food given to the chick; the broken line gives the increase in weight between the 1730 and 0800 weighings. Thus a feed of 12 gm. results in an overnight increase of 8 gm., etc.

\*All times G.M.T.

The weight of food received by my chicks during a single night varied between two and twenty-three grammes, but feeds of more than fifteen grammes were rare, and at some nests this figure was never exceeded. Probably all feeds of more than 10-12 grammes are the result of visits by both parents on the same night, and in practice, at the time of the midnight weighings, food totalling as little as six grammes in weight was given as two separate feeds. The visit-recording machines used in 1954 suggested that feeding by both parents occurs on nearly half of the nights when the chick is fed.

Some of the bigger feeds caused surprising percentage-increases in the weights of the young birds. The largest feed given to a chick of under ten days old weighed eleven grammes, the same as the chick's body-weight at the time the feed was received. Other large feeds, even as late as the fortieth day, resulted in sudden increases of over 50% in weight. Feeds of average size weighed from 30-40% of the chick's body-weight, just after the end of brooding, and only about 10% near fledging-time.

Table VIII shows the average size of feeds given to twenty chicks. The fledging-period is divided into ten-night stages, but a few feeds given to unbrooded chicks between the 6th and 10th nights, and feeds received in the chicks' last five nights in the nest, are also averaged.

TABLE VIII—AVERAGE SIZE OF FEEDS GIVEN TO TWENTY CHICKS OF STORM PETREL (*Hydrobates pelagicus*)

Nights	6-10	11-20	21-30	31-40	41-50	51-60	Last 5 nights
No. of feeds recorded	40	186	168	170	166	128	44
Total food received (gm.)	237	1208	1126	1112	1134	730	196
Average Feed (gm.)	5.9	6.5	6.7	6.5	6.8	5.9	4.5

The average feed is evidently of very uniform weight through most of the fledging-period. The smaller feeds of the last few days may reflect both the decline of the urge to collect food, and the fewer occasions on which feeds from both parents are likely to coincide. At some nests, only one parent may still be bringing food at this time.

Although rough weather seems to have little effect on the frequency of feeds, there is some indication that it influences their size. My figures are as yet inadequate to show this clearly, but twenty-two feeds given after a day of rough seas and winds of force 7 or more, averaged only 4.7 grammes.

The total weight of food given to each of twenty chicks from the eleventh night has been estimated, and ranges between 242 and 292 grammes, with an average of 270 grammes. Allowing an estimate of about 40 grammes for food given in the first ten days



and nights of the chick's life, the average amount of food required to bring a Storm Petrel chick from hatching to fledging would be some 310 grammes (11 ounces).

#### THE NATURE OF THE FOOD

Storm Petrels feed their young by regurgitation, with a pre-digested grey pulp probably derived from a wide variety of small surface-dwelling marine animals. They will also take offal thrown overboard from trawlers. This solid food is given to the chicks from the earliest stages, but may at first be liberally diluted with the strong-smelling yellowish oil, so frequently emitted by captured birds. The faecal matter of the young contains very little solid material in the first two or three days.

I have never been able to persuade a chick to vomit, but adults carrying food will cough it up when handled at night. They do this so readily and so vigorously that it is not easy to catch the sample. The few samples I have taken have not been subjected to microscopical examination, but obvious among them, and among many regurgitations not secured, were the headless remains of small fish about two inches long.

These fish occur so frequently that I am inclined to consider them the staple diet at this time of year, and tentatively suggest that the late breeding-season of the Storm Petrel may be timed to take advantage of the late summer abundance of sprats and small fry. This enormous supply of food is exploited also by other sea-birds, notably Kittiwakes (*Rissa tridactyla*), whose "circuses" are a feature of the summer and early autumn off Skokholm, and contributes to an interesting food-chain involving mackerel and other piscivorous fish, pursued in their turn by the smaller cetaceans and by Gannets (*Sula bassana*).

I have not been able to watch a parent feeding a chick, but once, by shining the beam of an electric torch into a hole where a chick was uttering the peeping hunger-cry, interrupted the process. The adult was standing rather erect before its half-grown chick, which was pecking vigorously, in an upwards direction, at the parent's chin, and peeping all the time with apparent excitement. The parent was too disturbed by the torchlight, and did not respond to these advances. The feeding process must be very similar to that of the Fulmar (*Fulmarus glacialis*), the chick taking the food direct from the parent's throat.

#### THE EFFECTS OF PARENTAL NEGLECT

My experience with Storm Petrel chicks leads me to conclude that prolonged underfeeding has more serious effects on the chick's development than the occasional intervals, usually of less than three nights, between long series of adequate feeds. Chicks receiving considerably less than the average amount of food (say, 290 grammes or less in the fledging-period) tend to be retarded in the development of their plumage, though the effects of fairly short spells of underfeeding may be corrected in a subsequent

period of normal feeding. The fledging-period may not be unduly prolonged by underfeeding, but some of these chicks leave at low weights, and must be at a disadvantage in learning to fend for themselves at sea.

Some Storm Petrels are more efficient parents than others, and two pairs which bred both in 1955 and in 1956 in my burrows (Numbers 20 and 24) leave much to be desired in this respect. In both years their chicks were underfed, retarded in development, and three of these are known to have departed at low weights. (The fourth was still in the nest when we evacuated Skokholm in late October 1955.)

The effects of underfeeding might best be studied after the known death of one parent, as in the remarkable case of the Manx Shearwater chick studied by Ralphs (1957), which was reared almost entirely by one bird. However, only one of my breeding birds has died when with a chick, and this was too late in the fledging-period to affect the chick's development (Burrow 8, 1955). At Burrow 17A in 1956, where one bird lost its mate before the egg hatched, the chick died when left unbrooded on the second day.

The minor intervals between feeds no doubt cause the chick some discomfort, but do not retard its growth, whilst the longer gaps of the last ten days or so occur when development is virtually complete. The unusual interval of six nights between feeds, at Burrow 20 from the 46th to 52nd days of the 1956 chick's life, had more interesting consequences. This chick had already been rather poorly fed, and was ill-prepared for a long period of starvation. (Far longer starvation periods, of up to twenty days, were recorded by Roberts for snowbound Wilson's Petrel chicks.) Its weight declined from 40 to 27 grammes in seven days, following the usual pattern of steadily smaller decreases on each succeeding day. By the fourth evening it appeared very weak, and on the sixth seemed to be moribund, with eyes closed and little sign of movement. The following morning the chick had been fed, and was remarkably lively. Obviously survival had been aided by a general slowing of the metabolism, similar to that described by Lack (1956) for chicks of the Swift (*Apus apus*) under comparable circumstances. This Storm Petrel chick remained some ten days behind normal chicks in plumage development, and particularly in the loss of its nestling down, although the growth of its primary feathers was not so much retarded. It eventually departed at a rather low weight after the record fledging-period of 73 days, but survived to be captured by a fishing vessel off Belle Ile, W. France, in late December 1956.

#### GROWTH-CURVES BY WEIGHT

In Fig. 3 is given a growth-curve obtained by plotting the average evening weights of 32 chicks, at five-day intervals through the fledging-period, with the addition of the average weights at 24 hours old, and on the evening before departure.

Reference to Tables VII and VIII will show how well the curve corresponds to the frequency and size of feeds, with the steep increase in weight until the 20th-25th day (from 5.7 to about 30 gm.), the more gradual increase from the 20th to 50th days (about 30 to 42 gm.), and the final decline to the departure weight (33.6 gm.) on the 63rd day.

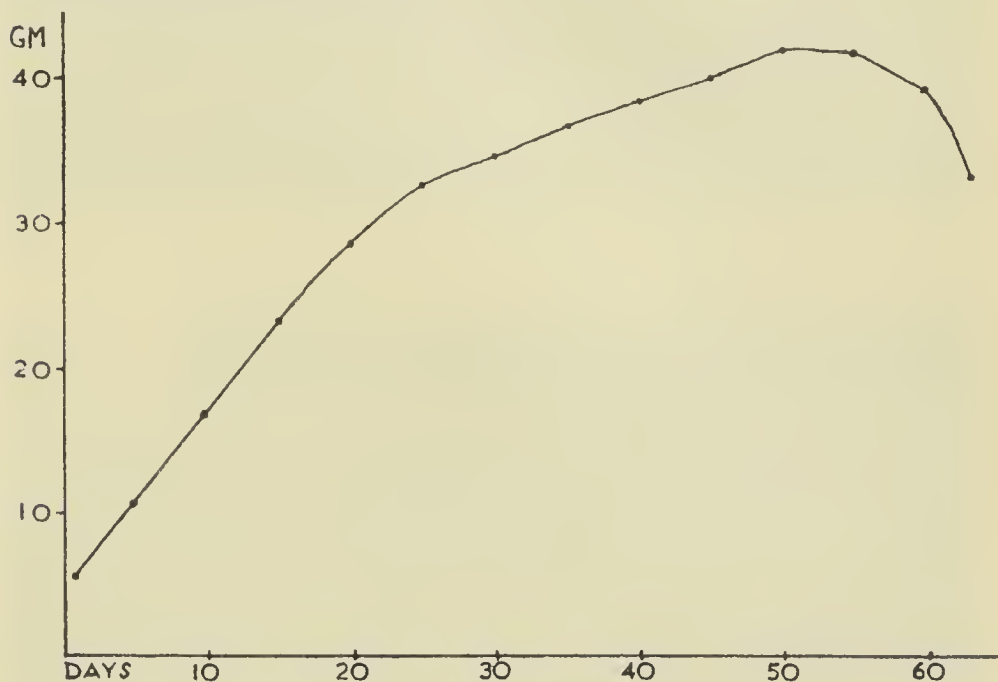


FIG. 3.—AVERAGE GROWTH-CURVE OF 32 CHICKS OF STORM PETREL (*Hydrobates pelagicus*)

The average weight of 50 adults was 28 grammes. Many chicks will achieve twice this figure immediately after a feed about the 50th day, and a few exceptionally well-fed young have had evening weights of over 50 grammes at this time. The excess weight at departure is presumably in the form of reserves of carbohydrates, designed to carry the juvenile over its first few days at sea, until it can feed itself adequately.

Fig. 4 shows the actual growth-curves of two chicks, constructed by plotting all the evening weights and then drawing the curves by eye. The unbroken line is the growth-curve of the chick in Burrow 11B, 1956, an extremely well-fed bird; the broken line is that of chick 11, 1954, which was indifferently fed.

The well-fed chick's growth-curve rises steadily to a high peak, and since the requirements of development are quickly met, the peak occurs earlier than is usual, and is followed by a longer decline to a normal departure-weight. The poorly-fed chick, on the other hand, has a much flatter curve, with a later and less obvious peak. The period of declining weight is shorter, the departure-weight well below normal, and the fledging-period is a few days longer.



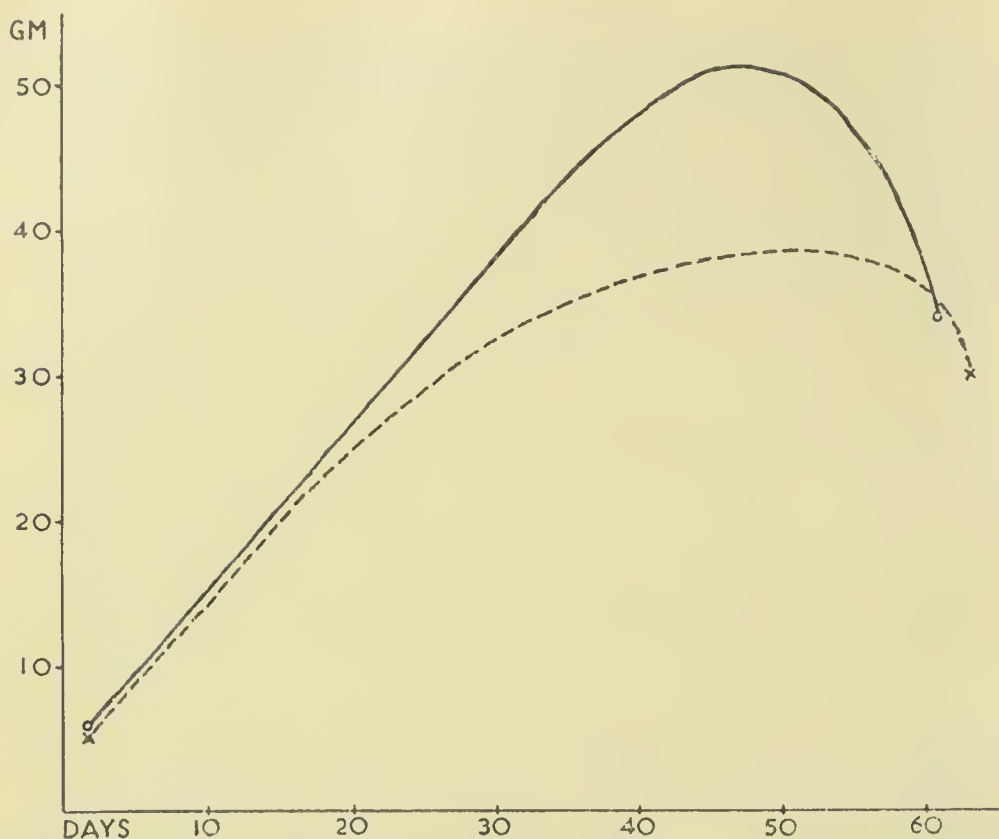


FIG. 4—GROWTH-CURVES OF 2 STORM PETREL (*Hydrobates pelagicus*) CHICKS. The unbroken line shows the curve of a well-fed chick, and the broken line that of a poorly-fed one.

#### DEVELOPMENT OF PLUMAGE AND SOFT PARTS

My notes on development were taken with one overriding consideration in mind. I hoped it would be practicable to compile a chart of growth, whereby the age of any chick might be determined with reasonable accuracy. A chart such as this would make it possible to estimate the timing of the breeding-season at any colony, and would also allow work on problems connected with the chick stage, without any preliminary disturbance of the adult birds. The only alternative, if one is to avoid the probability of desertions in the egg-stage, is to accustom the adults to regular observation from the time of their earliest visits to the colony.

The most I can claim for my results is that I can age about 80% of chicks to the nearest five days. The remaining 20% or so consists of underfed and retarded birds.

A few general remarks on the plumage and on my methods are a necessary introduction to the description of development. Storm Petrel chicks, like those of many other Tubinares, have two generations of nestling-down. The protoptiles (first generation) share a common shaft with the mesoptiles (second generation), and the latter succeed the former by continuous growth. The true feathers, as they emerge, carry both downs on their tips, until



Adult and egg



Chick one day old



Chick five days old

Angela Davis

STAGES IN THE GROWTH OF YOUNG STORM PETRELS (*Hydrobates pelagicus*)  
 SKOKHOLM, PEMBROKESHIRE, 1954-1956

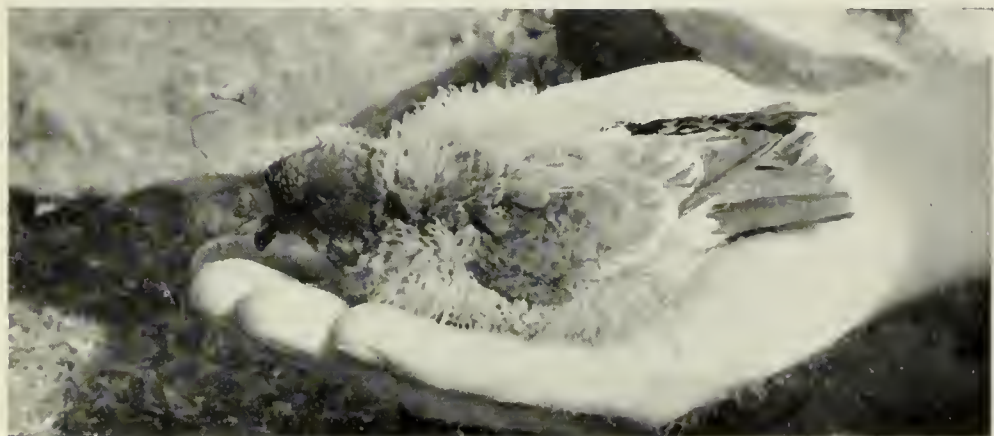
At one day old (*centre*) the chick is closely covered with soft silver-grey down, except for an area on the crown (shown here), round the eyes and on the lores and chin, which are almost bare; like the legs and feet the base of the bill is pinkish-grey, but the tip is black; the eyes are closed. By the 5th day (*bottom*) the eyes of some chicks are wide open, but not the one here; note the shape and pattern of the bill; the egg-tooth disappears about now. (*Top*) Note the large size of the single egg compared with the adult, and the lack of nesting material. (see pages 371-384).



Chick 20 days old



Chick about 35 days old



Chick about 45 days old

Angela Davis

STAGES IN THE GROWTH OF YOUNG STORM PETRELS (*Hydrobates pelagicus*)

SKORRHOLM, PEMBROKESHIRE, 1954-1956

By the 20th day (*top*) the bill is almost black, the legs dark grey ; and the tips of the primaries begin to emerge from the sheaths, which are clearly visible here ; the bald crown is now obscured by short down. By the 35th day (*centre*) the down is becoming patchy on the wings, and the bare face is getting covered. By the 45th day (*bottom*), or a few days earlier, nearly all the down has gone from the head and wings and it is becoming increasingly patchy on the back ; note the white edges to the greater coverts (see page 381).





Chick 50 days old



Chick 60 days old



Retarded chick 43 days old

Angela Davis

STAGES IN THE GROWTH OF YOUNG STORM PETRELS (*Hydrobates pelagicus*)  
SKOKHOLM, PEMBROKESHIRE, 1954-1956

By the 50th day (*top*) there is little down above, but on the under-parts it remains thick. By the 60th day (*centre*) most healthy chicks have practically none left, except for a few tufts on the belly. The young leave the hole between the 56th and 73rd day, the late-goers being underfed and retarded chicks that from the 35th day onwards may be as much as 10 days behind. Compare the downy and "dejected" appearance of the 43-day old retarded chick shown here (*bottom*) with the normal chick of 45 days opposite (plate 50, bottom) (see page 382).



(by permission of "Country Life")

M. W. Ridley

COLONY OF SOOTY TERNS (*Sterna fuscata*): DESNOEUF'S ISLAND, SEYCHELLES,  
JUNE 1955

This gives some impression of the vast sea of terns, Sooties and some Noddy Terns (*Anous stolidus*), stretching in every direction. Desnoeufs Island is only 97 acres in area, yet 2,420,000 Sooty Terns were estimated there when these photographs were taken (see page 386).



(by permission of "Country Life")

M. W. Ridley

COLONY OF SOOTY TERNS (*Sterna fuscata*): BIRD ISLAND, SEYCHELLES, JUNE 1955  
These terns will nest right out in the open, but sites under the edges of bushes and among grass are apparently preferred and occupied first. Note the nesting birds scattered everywhere among the shrubs—in spite of the fact that these are covered with vines which entangle both adults and young and cause many deaths (see page 388).





John L'Arham

SOOTY TERN (*Sterna fuscata*) SETTLING ON EGG: ABROLHOS ISLANDS, W. AUSTRALIA, NOVEMBER 1956

Note the striking black-and-white pattern of the plumage, and the fairly long, broad-based bill which, like the feet, is black. The crown and nape, and the line from bill to eye, are jet black, the rest of the upper-parts a browner black, contrasting with the white U-shaped patch on the forehead and the white under-parts. This shows a typical nest-site on coral sand, beneath a salt-bush (*Atriplex*); only a single egg is laid in a scrape which is unlined, though sometimes encircled with a few bits of stick, grass or leaf (see page 388).





(by permission of "Country Life")

M. W. Ridley

SOOTY TERNS (*Sterna fuscata*): DESNOEUF'S ISLAND, SEYCHELLES, JUNE 1955  
Here the forehead patch is particularly well shown: the rather similar, though smaller Bridled Tern (*S. anaethetus*) has this extending backwards to form a superciliary stripe, and also has a light collar separating black crown from rather browner and greyer back and wings (see page 387).



(by permission of "Country Life")

M. W. Ridley

SOOTY TERNS (*Sterna fuscata*) AND YOUNG: DESNOEUF'S ISLAND, SEYCHELLES, JUNE 1955

These chicks are only about 4 weeks old (they are fully feathered in about 5 weeks, but remain on the breeding-grounds for about 8), but their plumage is typical of what is worn until after the first winter. They are sooty brown, greyer below, flecked with patches of white on the mantle and wings, and with grey edges to the head-feathers giving a hoary appearance (see page 387).



John Warham

SOOTY TERN (*Sterna fuscata*) IN FLIGHT: ABROLHOS ISLANDS, W. AUSTRALIA,  
NOVEMBER 1956

This bird is very slightly smaller than a Sandwich Tern (*S. sandwicensis*), with relatively longer wings and an equally forked tail. From below, the bird looks almost completely white, its forehead matching as it looks down. The complete black-and-white plumage is retained all the year (see page 387).



John Warham

SOOTY TERN (*Sterna fuscata*) AT NIGHT: ABROLHOS ISLANDS, W. AUSTRALIA,  
NOVEMBER 1956

The bird on the left is a Wedge-tailed Shearwater (*Procellaria pacificus*). Sooty Terns are very active at night—indeed in some colonies the change-over at the nest is normally effected after dark, and there seems to be almost more noise than during the day—with the result that the species has long had the name “Wideawake” which is also a rendering of its call (see page 388).



*Gilchrist Studio, Holborn*

IMPRESSION OF PIGEON (*Columba* sp.) ON SHOP WINDOW, LONDON, 1951



(by permission of "The Field")

*H. S. Houghton*

IMPRESSION OF BIRD, PERHAPS OWL, ON HOUSE WINDOW, BIRMINGHAM,

OCTOBER 1950

A note about these photographs appears on page 393. The assumption is that in each case the impression was caused by the bird's powder-down (see also *antea*, vol. xlviii, plate 57), but even so the clarity of the outline seems remarkable. The upper impression measured a little over 21" from wing-tip to wing-tip, and the lower about 20".



the downs are eventually sloughed off. The division between the two downs takes the form of a slight whitish thickening of the shaft and a narrow interval which has no barbs. Both downs are of a medium silver-grey colour, rather paler on the under-parts. Some chicks are a little darker in shade than the majority. *The Handbook's* description, "greyish sooty-brown", is certainly misleading, for there is little or no element of brownness. (I suspect that this description was made from foxed skins; the same error occurs in respect of other sea-birds.)

The wing-measurements quoted are taken, with a stopped rule, from the carpal joint to the tip of the longest primary feather, and represent the chord of the natural curve of the wing. Other measurements were taken with dividers. Twenty-four series of measurements were obtained, including those of four chicks which were noticeably retarded. These four will be referred to separately in the description of growth which now follows. Photographs of some of the stages appear on plates 49-51.

*1st day* (plate 49, centre). On hatching, the chick is closely covered with down 5-7 mm. in length, except on most of the crown, and an area round the eyes, the lores, and the chin, which are almost bare. The nostril-tube, the base of the bill, and the legs and feet are hardly pigmented, pinkish-grey in colour. The bill has a black tip, ending about 1 mm. before the nostril-tube on the upper surface, but extending about 2 mm. nearer the gape at the sides. There is a small white egg-tooth near the tip of the upper mandible. The eyes are closed.

*2nd day.* In a few chicks the eyes are "slit", and in one they were half open. Storm Petrel chicks may not be born blind, as has been stated, but merely unable at first to bear the light, when taken out for examination.

*5th day* (plate 49, bottom). The eyes of some chicks are now wide open. They are dark brown in colour, as in the adult.

*6th to 9th day.* The second down breaks through on the back and scapulars. Egg-tooth disappears about the 6th day.

*10th day.* The eyes of all chicks are now wide open on examination. The unpigmented soft parts are noticeably greyer in colour. The baldness of the crown is now obscured by a growth of short down, and by the lengthening down around it.

*11th to 15th day.* The second down appears on the forewing. In most chicks this occurs on the 12th or 13th day, and it is a valuable feature for ageing the chicks.

*16th to 19th day.* The sheaths of the primary feathers emerge on the forewing.

*20th day* (plate 50, top). The bill is now almost black, the legs dark grey. In most chicks the tips of the primaries are emerging from the sheaths. The tarsus measures 17-19 mm.

*25th day.* The primaries are now 3-8 mm. out of sheath in normal chicks, but only just emerging in retarded ones. Normal wing-measurements are 34-39 mm.

*30th day.* The wing measures 43-50 mm. in most chicks, up to 40 in retarded ones. The bill is now jet black in most, the legs are darker. The rectrices are emerging from sheath.

*35th day* (plate 50, centre). Normal wing-measurements 54-63 mm.; retarded birds about 49-50. The down has gone from the tips of the primaries, and is becoming patchy on the wing-coverts. (From this time the retarded birds may be up to ten days behind in the loss of their down—compare the bottom photographs in plates 50 and 51.) The bare face is beginning to be covered by the tips of emerging feathers.

*40th day.* Wing-measurements 66-75 mm.; about 60 in retarded birds.

Some or most of the down has gone from the head, and it is becoming very patchy on the back. Healthy chicks are now becoming increasingly active within the burrow, and loss of down is probably hastened by abrasion, particularly in low and circumscribed holes. The legs are now quite black. The tarsus is up to normal adult length at about 22 mm.

*45th day* (plate 50, bottom). Wing-measurements 75-90 mm.; 66-72 in retarded chicks.

*50th day* (plate 51, top). Wing-measurements 90-104 mm.; 78-85 in retarded chicks, which can now usually be distinguished by large amount of down, lack of gloss on the new feathers, and "dejected" appearance (as in plate 51, bottom). In normal chicks, there is now little or no down on the upper-parts, except for a tuft on the nape or rump, or a few wisps on the inner wing-coverts. Down remained thick on the under-parts in most birds.

*55th day*. Wing-measurements 105-112 mm.; 92-99 in retarded birds. Many chicks now have only wisps of down still attached to the nape, rump, throat, or belly. The only thick area on any normal chick is on the belly.

*60th day* (plate 51, centre). Wing-measurements 114-118 mm.; 104-110 in the retarded. Most healthy chicks have little or no down remaining.

On departure (56th to 73rd day) the majority of fledglings are downless, though some still have considerable tracts on the belly. The plumage closely resembles that of the adult, though the white wing-bar formed by the tips of the greater coverts is much more prominent than in any of the thousand or so adults I have handled between April and September, and may be a valid means of distinguishing juveniles at sea during the autumn. The average wing-length of 24 juveniles at departure was 116.5 mm. (110-120), compared with an average of 117.5 (112-122) in 39 adults caught between April and September.

#### BEHAVIOUR OF THE CHICK

Until about the 30th-35th day, the chick's normal attitude in the nest is a completely relaxed position with the bill resting on the ground and the wings drooping. For the first few days it appears quite incapable of raising its head, though evidently it must do so when fed.

At first the faeces are deposited indifferently in any part of the nest, but as the chick becomes stronger they are often squirted into one particular corner or latrine. They are not enveloped in a gelatinous sac, and there is no nest-sanitation by the adults.

The only note given by chicks is a prolonged and sibilant "pee-pee-pee", used at feeding-time and also as a fear-note by chicks not accustomed to being handled. (This call, in a louder form persists as a fear-note in the adult; see Appendix.)

From about the 35th day, chicks become more active, and will roam about the burrow, though usually soon returning to the scrape. They squat in the nest with the head and wings in a more upright position. The chicks I weighed regularly seldom made any attempt to move away when I opened the nest, but most of the strange chicks I was ringing in September would scuttle out of reach whenever possible.

In the last few nights before fledging, many chicks will go to the entrance of the burrow, and there exercise their wings more or

less vigorously. On the final night, they leave the hole and make their way to some eminence near-by—shuffling along, since their legs are set too far back for upright walking, with the aid of their wings, and climbing almost sheer surfaces with the aid of both wings and bill. From the summit of a rock or wall, often after much hesitation and wing-flapping, they launch themselves in the air, and fly out to sea, alone.

#### CHICK MORTALITY

Thirty-seven chicks have hatched out in my burrows in the three years, and four of these have died in the nest, all within 48 hours of emerging from the egg. Two (Nos. 9 and 11A, 1956) died as a result of the flooding of their nests in very heavy rain; one (No. 17A, 1956) as a consequence of the earlier death of one of its parents; and one (No. 4, 1954) from unknown causes.

The only other death known to me, and for which I can suggest a cause, was that of a very late chick in 1955, which was not due to fledge until about 20th November. This had been dead for at least two weeks when I was able to revisit Skokholm and examine the nest on 19th November, and had probably been deserted prematurely by its parents. This must be a common fate of November chicks. However, these probably number under 1% of the total number of chicks in any one year.

Fledglings must be at their most vulnerable to predators about the time of departure. Those Great Black-backed Gulls (*Larus marinus*) which are practised in the art of catching shearwaters at night, undoubtedly take a small toll of Storm Petrel fledglings; and the chief scourge of adult petrels, the Little Owls (*Athene noctua*), must find the fledglings particularly vulnerable. Fortunately, this species was eliminated at Skokholm in the spring of 1954, and has not been able to recolonize the island.

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### Appendix—Comments on the B.B.C. recordings of Storm Petrels

At the request of the Editors of *British Birds*, I am giving in this appendix my comments, in the light of my experience, on the Storm Petrel recordings made by Mr. Ludwig Koch, which are now in the B.B.C. Library.

*B.B.C. Library No. 15091 (Front), Band 2: "The colony"*.

This recording consists chiefly of the protracted churring song used by the birds to advertise their presence in the burrows (*antea*, p. 95). The singing bird(s) seem to be at some distance from the microphone, and the purring is sometimes almost lost in the background noises of the record. There are remarkably few of the "tchick" or hiccoughing notes which are usually introduced singly into the song at regular intervals of a few seconds. The recording is confused by the presence of a bird, nearer the microphone, which is not singing, but frequently uttering an alarm-note (not referred to in the text of my paper), written "up-cherrk". This note is used when the bird senses danger from the noise of men, etc., outside its hole. It closely resembles the "terr-chick" note often used in the display-flight (*antea*, p. 96).

*B.B.C. Library No. 15016 (Back), Band 1: "Call Note"*.

This band is almost entirely of an extraordinary "pee-pee-pee", very rapidly repeated. I have very seldom heard this noise except from a very frightened bird, and I call it the "fear-note". It is sometimes given by birds caught in nets, or in the hand by birds not accustomed to being handled. Exceptionally (in my experience) it is emitted when some squabble has arisen between two birds in a hole, probably by the one that is getting the worst of the scuffling. (Hungry or frightened chicks used a similar, but quieter, noise—see page 382.)

*Band 2: "Alarm Note"*.

This is a fairly straight-forward recording of the alarm-note mentioned in discussing the first record. Some snatches of the peeping fear-note come in also.

# PHOTOGRAPHIC STUDIES OF SOME LESS FAMILIAR BIRDS

## LXXXIII. SOOTY TERN

Photographed by M. W. RIDLEY and JOHN WARHAM

(Plates 52-55)

TWO-AND-A-HALF MILLION terns in less than a hundred acres! For those of us who know the Sooty Tern (*Sterna fuscata*) only as the name of a species that has been recorded in Britain on some 18 occasions and which has similarly straggled to France, Italy and Germany from time to time, though is otherwise unknown in western Europe, it is difficult to imagine the fantastic numbers in which it and one or two other tropical terns breed on the lonely southern islands and coral reefs which form their habitat. Terns are, of course, fundamentally southerly in their distribution, as has been pointed out by Fisher and Lockley (1954), whereas the closely related gulls are primarily northerly. Yet all terns are considerable migrants and it is therefore not surprising to find that 13 out of the 39 species have occurred in the British Isles, as against only 15 out of 42 gulls.

The Sooty Tern is primarily an island nester, probably partly because the tropical mainland, with its endless mangrove forests along the coast, seldom provides a suitable habitat and is always more open to Man and other predators, and partly because, unlike most terns, the Sooty is essentially an oceanic species. It comes to land only to breed, like the rather similar Bridled Tern (*S. anaethetus*), but the often associated Noddy (*Anous stolidus*), though very much a sea tern, is not pelagic in that it roosts all the year round on some islands. M. W. Ridley (*in litt.*) says that in the Indian Ocean no one knows where the bulk of the Sooty Terns spend the non-breeding season, certainly not near the nesting islands. They do not swim and it is suggested that they sleep and feed in mid-air. The Sooty breeds in the Caribbean, on a number of islands in the S. Atlantic, in many places in the S. Pacific, off the coasts of Australasia, and in the Indian Ocean as far west as the Seychelles, Mauritius and Reunion. It may also breed along the Guinea coast of tropical W. Africa, where it occurs in considerable numbers, but like the Bridled and Royal Terns (*S. maxima*) (see *antea*, vol. xlviii, plates 13-18, pp. 118-119)—and also the Caspian (*Hydroprogne caspia*)—it is something of a problem bird there, and there is still no record of eggs or young being found on the W. African shore (see, e.g., Fisher and Lockley, 1954, p. 21).

Probably the three most famous Sooty colonies are on the Dry Tortugas (west of Florida Keys in the United States), on Ascension Island (S. Atlantic) and on Desnoeufs Island (Seychelles). Estimates on the Dry Tortugas have shown a rise from about 7,000 nests in 1903 (see Bartsch, 1919) to totals fluctuating between 30,000 and 55,000 nests between 1937 and 1947 (Sprunt, 1948). But this is nothing compared with Ascension and Desnoeufs. Of the number of birds on the former Chapin (1954) wrote that

after several years on the island J. Noel Tomlinson "had not yet been able to decide whether they might number one million or perhaps two. It is my belief that in 1942 there may possibly have been a million." While on Desnoeufs (plates 52 and 54)—perhaps a corruption of the French "Island of the Eggs"—Ridley (1956) made a particularly careful study and calculated the whole population at 2,420,000 birds. To appreciate the full grandeur of this colony it must be remembered that Desnoeufs is only about 97 acres in area, so that this figure would represent an average of approximately  $2\frac{1}{2}$  pairs per square yard if every yard of the island was occupied (actually the average was  $3\frac{1}{2}$  over most of the suitable parts of the island).

Earlier calculations have put the Desnoeufs population at about 5 million *pairs* in 1931 and at least a quarter of a million in 1937 (Vesey-Fitzgerald, 1941). It seems likely, however, that the former was an over-estimate, bearing in mind that the figure is four times the size of Ridley's. Nevertheless, some variation might be expected, because, as Vesey-Fitzgerald (*op. cit.*) has commented, Sooty Terns tend to arrive, breed and depart in large groups, and there may be some variation in egg-dates in different areas. On Desnoeufs the first birds arrive in May and many eggs are laid by the end of that month, but Ridley adds: "Throughout our stay birds arrived in greater and greater numbers; generally they occupied an area for a few days before laying, and we discovered that they nearly always laid in the afternoon." This is the normal procedure—a mass arrival of all the birds of one area, which then occupy that area for anything from a few days to two or three weeks, after which there is suddenly an almost simultaneous laying of eggs.

Most species on some of these tropical islands may have eggs at almost any season, but not so the Sooty Terns which in any one area are concentrated by their highly developed social nesting at a particular time of year, this varying according to latitude, though chiefly starting between April and November; the birds are present for 4-6 months and then depart until approximately the same time the following year. There are, however, two very curious exceptions to this, which have been discussed by Chapin (*op. cit.*) at some length. The first concerns Ascension, where he has shown from records "compiled over a period of eleven years . . . that Sooty Terns . . . assemble to begin nesting at average intervals of 9.6 months. Thus instead of nesting four times in every period of three years, as has often been said, they begin to nest five times in every four-year period. The reason for this unusual cycle of reproduction appears to be the lack of any marked seasonal change in the weather at Ascension Island, and the pronounced social bond between the members of a Sooty Tern population. Relieved of any seasonal hindrance, it must be supposed, they follow an internal rhythm." Thus the birds are present for between  $6\frac{1}{2}$  and 7 months, then completely absent for between 3 and  $2\frac{1}{2}$  before returning to start a new season. In his unsuccessful search



for evidence of any similar state of affairs in any other Sooty Tern colony, Chapin then discovered the only slightly less curious fact that on some islands in the central Pacific, from Christmas Island north to the vicinity of Oahu, Sooty Terns have two distinct breeding seasons, six months apart, in each year; the only reasonable conclusion that can be drawn is that those populations are divided into two quite separate groups with different breeding seasons.

Most species of terns are white with grey back and wings, and a black crown which they lose in winter; a lesser number, including several of the marsh terns, are mainly dark, both above and below, in breeding plumage; a few are largely white or pale grey; but only three are uniformly dark above and white below—the Sooty, the Bridled and the Spectacled (*S. lunata*)—and each of these has its summer and winter plumage the same. Apart from differences in head pattern, the latter two species are noticeably smaller and have greyer backs. Plates 53 and 54 upper bring out the striking black-and-white pattern of the Sooty Tern very clearly—the sooty black upper-parts and line from bill to eye, and the white under-parts and forehead (the Bridled Tern also has a light collar and the forehead patch is extended backwards to form a superciliary stripe). The fairly long, broad-based bill and the feet are black. The tail is deeply forked and, as can just be seen in some of these photographs, the outer web of the long outer streamer is white, forming a narrow border to the black of the rest of the upper tail. The Sooty Tern is very slightly smaller than a Sandwich Tern (*S. sandvicensis*) with relatively longer wings. An indication of the size of the bird can be got from plate 55 lower where a Sooty Tern is seen flying near a Wedge-tailed Shearwater (*Procellaria pacificus*), which is slightly smaller than a Sooty Shearwater (*P. grisea*), rather larger than a Manx (*P. puffinus*). Also brought out in this photograph and in the one above it (plate 55, upper) is the way in which the white forehead of this bird (and of quite a few other terns) fits in with the white under-parts when the bird looks down as it passes overhead.

The juvenile (plate 54, lower) is really much worthier of the name “sooty”: the whole of the upper-parts are sooty brown flecked with patches of white on the mantle and wings, and grey fringes to the head-feathers give the bird a venerable appearance; the under-parts are brown or grey-brown, becoming greyer on the belly. A plumage similar to this is worn during the first winter.

Though Bowdish (1900) found on Desecheo Island, near Puerto Rico, in the West Indies, a large colony of Sooty Terns breeding on ledges on limestone cliffs, 10-40 feet above the beach, this species normally nests on the ground—on sand or coral, on grass, on earth or even on bare rock. Some of the breeding islands, like the part of Desnoeufs shown in plate 52 upper (most of Desnoeufs is covered with thick, low vegetation), are practically devoid of cover, but where there is good vegetation nesting-sites are usually first chosen round the edges of small bushes, between and under taller ones, or among grass. A typical site is shown in

plate 53: this was taken on one of the Abrolhos Islands off W. Australia and illustrates a scrape in coral sand beneath a salt-bush (*Atriplex*). This liking for cover is also brought out in plate 52 lower which was taken on Bird Island, another of the Seychelles that holds about 65,000 pairs (Vesey-Fitzgerald, 1941). Here one can see that birds and nests are scattered everywhere among the shrubs; this seems rather surprising when we learn that these bushes are covered with vines (*Cassytha*) that often entangle young and even adults and cause many deaths. However, Ridley concluded from his observations on Desnucufs that any sort of land-mark was much favoured: he noticed that "flat basins of muddy ground with no landmarks such as bushes or stones were avoided until the end of the season, when the pressure had become so great that space was indeed hard to find". In the Dry Tortugas, already mentioned, which are flat islands of coral and coral sand covered with cactus and bay cedar, the Noddies build their quite substantial nests in the vegetation while Sooty Terns sit below them.

The Sooty Tern normally makes no nest other than a scrape in the coral or sand, but occasionally a few bits of stick, grass or bay cedar leaf may be pulled round the edge, particularly while the scrape is being made, but also while the bird is incubating, if they are already lying within reach. The single egg—occasional cases of 2 are probably the result of layings by different birds—is a little larger in proportion than the eggs of those terns that habitually lay two or three, and it is brooded by both sexes in turn, after the usual manner of the genus, except that one bird normally sits for several hours at least, often for 24 hours, sometimes for two or three days (Watson, 1908, found that on the Dry Tortugas the change-over normally took place at night every 24 hours). One reason for this is that Sooty Terns are much more pelagic than most and fish far out to sea. Sometimes this may be a distance of no more than 20-30 miles, but Wilkins (1923) showed that Sooties may forage regularly as much as 200 miles from the breeding-place. Incubation lasts 26 days (Watson) or 28 (Ridley) and the young are fully feathered in 30-36 days, though they remain on the breeding-area for about 8 weeks (the chicks in plate 54 lower are about 4 weeks old).

There is nothing remarkable in the night change-over, for Sooty Terns appear to be almost more active then (plate 55, lower) than by day, and flighting over at night is in fact often the first announcement of the return to the breeding-area. This nocturnal behaviour and the incessant uttering, day and night, of a harsh, clearly enunciated "ker-wackv-wack" have earned the species the nickname of "Wideawake" and the famous colony on Ascension Island has long been known as "Wideawake Fair". Ridley, commenting on the perpetual screaming says: "Their cry . . . was never out of our ears . . . and when in their midst we could not hear one another speak more than six feet away."

Evidently small fish and cephalopods form the bulk of the Sooty

Tern's diet: Ridley found that flying fish and small squids were most commonly taken. Unlike most of the sea terns, the Sooty, Noddy and Bridled do not dive for their food, or very rarely, but snatch their prey from the surface as they swoop along: small fish are caught as they leap from the water. Because they eat so much of their food such long distances from the nesting-area, Sooty Terns feed their young on regurgitated matter, not on the offerings of whole fish that form such a characteristic sight in most terneries.

I.J.F.-L.

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## FIELD-NOTES ON WHITE FEATHERING AT THE BASE OF THE BILL AND WHITE UNDER TAIL-COVERTS IN THE TUFTED DUCK

By E. H. GILLHAM

#### INTRODUCTION

FOR MANY YEARS adult female and immature Tufted Duck (*Aythya fuligula*) have been observed with a varying amount of white feathering at the base of the bill or on the under tail-coverts. At intervals, either one or both features have been discussed or figured in the literature, as for example in: *The Handbook; British Birds* (Rayner, 1950); *A Field Guide to the Birds of Britain and Europe*; and in *The Bulletins of the B.O.C.* (Harrison, 1954; Sage, 1955). From consultation of the above and perusal of coloured plates in *The Fifth Annual Report of the Wildfowl Trust* the following points emerge: (i) that white feathering at the base of the bill is occasional; (ii) that white under tail-coverts seem to be more frequent; and (iii) it would appear that (i) and (ii) have been thought of only as variations—as may well be the case sometimes—and not as transient stages of plumage which, in adult females, are associated with the post-nuptial moult.

Personal observations on this subject were made in the years 1953-56 inclusive, when Tufted Duck, in St. James's Park, London, were scrutinized on about 300 out of 550 days within the period 27th April-14th October. Details of watch periods in the



first three years have been mentioned in an earlier paper (Gillham, 1957), to which may be added observations made on 90 days in 1956 between 18th May and 7th October.

This paper concerns approximately five months of the year and it is not suggested that the white feathering in adults or immatures ended with the cessation of regular observation, for it persists well into winter and early spring. To give an example: among 50 adult females and immatures on 24th January, one year, there were at least three birds with small to medium-sized dirty white masks and one with fairly conspicuous white under tail-coverts.

WHITE FEATHERING AT THE BASE OF THE BILL

*Juveniles.*

Close scrutiny of 100+ juveniles aged between six and twelve weeks showed that it was uncommon for the "white" to be (a) as extensive as in most adult females, (b) as *white* as in adult females, or (c) in *one patch* as is so frequent when the feature is fully developed in adult females. Usually, with juveniles, *separate dirty white marks* roughly either crescent-shaped, lozenge-shaped, or like small round discs, developed close to, and on either side of, the base of the upper mandible from about the fifth week of age. The first two types of patch touched the whole of the curved side-ridges of the base of the bill. A fair proportion of juveniles had only a few white flecks or no white at all, and none was seen with any white on the forehead in the vicinity of the culmen.

*Adult females.*

In adult females the white feathering *did not develop* until the post-nuptial moult and was noted only from about the third week of July until early October (when regular observations terminated). While the number of adult females with a *prominent* white patch was small (females with very small amounts of white are not taken into consideration), they formed a high proportion of those adult females present:—

TABLE I—PROPORTION OF ADULT FEMALE TUFTED DUCKS (*Aythya fuligula*) WITH A PROMINENT WHITE MASK

Year	Total number of adult females with a prominent white mask	Total number of adult females present	Date
1953	3	4	5th Sept.
	1	4	6th Oct.
1954	1	4	10th Aug.
	2	4	16th Aug.
	2	3	23rd Aug.
	1	2	31st Aug.
1955	2	5	6th Sept.
	2	2	27th Sept.
1956	3	12	30th July
	6	9	31st Aug.
	5	8	11th Sept.
	5	14	14th Sept.
	2	8	16th Sept.
	1	6	5th Oct.

From late July females began to leave the lake and from the third week of August only a third, or fewer, of the original population remained. Thus, a number of birds with a small amount of white departed before the white feathering may have become fully developed. In September, there was a passage of adult females, some of which had a prominent white patch on arrival.

Although the white was sometimes in two separate patches similar to those in juveniles, especially in the "developing" and "declining" stages, when fully developed it was much more like the white mask of the adult female Scaup (*A. marila*) in winter plumage. Only once have I seen the mask equal in size to that of Scaup in winter plumage, and in this particular Tufted there was also some dirtier white around the lower mandible.

*The Field Guide* stresses that in female Tufted the patch is *never* as large as in the female Scaup, but fails to mention that in summer the adult female Scaup has the white mask much reduced in size or completely absent (*cf.* Kortright, 1943; and plate in *Fifth Annual Report of the Wildfowl Trust*).

Some female Tufted do not acquire the white patch in their post-nuptial moult. For instance, one female, recognized by her damaged wing and a ring on her leg, had only a "peppering" of white flecks around the base of the bill during summer and autumn in 1954-56 inclusive.

#### WHITE UNDER TAIL-COVERTS

##### *Juveniles.*

Not one of the 100+ juveniles aged between six and twelve weeks had such conspicuous white under tail-coverts as those adult females showing the maximum amount of white in the same position. Normally, the centre of the juveniles' under tail-coverts appeared *whitish*, while the surrounding area was a dirtier white. Some birds had only inconspicuous white flecking.

##### *Adult females.*

Quite a few adult females acquired prominent white under tail-coverts in the post-nuptial moult. For example: 3 out of 4 birds on 26th September, and 6 out of 12 on 8th October, in 1953; 7 out of 9 on 31st August, 2 out of 5 on 10th September, 5 out of 14 on 14th September, 2 out of 5 on 27th September, and 1 out of 6 on 5th October, in 1956, all possessed this feature. Birds which acquire the white mask may *also* have conspicuous white under tail-coverts as was the case with 4 out of 9 females on 31st August 1956.

When Tufted are on the surface between spells of diving, the tail usually lies flat on the water, thus concealing the under tail-coverts until the actual dive occurs. When not intending to dive, Tufted commonly sit high in the water with tails cocked up and

it is then that the females with prominent white under tail-coverts resemble Ferruginous Duck (*A. nyroca*). In view of this, the statement in *The Field Guide*, that when Tufted and Ferruginous are seen together, the latter sits higher in the water and holds its tail higher, is liable to confuse rather than help inexperienced field-observers.

#### *Adult males.*

Some adult males also acquire white under tail-coverts in the post-nuptial moult. Since most males leave the lake to moult elsewhere, my observations are limited. From late July 1956, only two adult males remained and these were in wing-moult in the third week of August, at which time both had white under tail-coverts though neither had this feature earlier on. On 27th August the number of adult males had increased to five, all of which had some white on the under tail-coverts. The area of white was less extensive than in the adult female and closely resembled that of the juvenile as already described, except that it seemed more conspicuous on account of its being sharply contrasted against a darker surrounding area as the birds floated buoyantly on the water.

None of the adult males present on the breeding-lake was seen with white under tail-coverts before the beginning of August.

#### SUMMARY

1. The white feathering at the base of the bill and on the under tail-coverts of Tufted Duck was studied in St. James's Park, London, between late April and early October in the years 1953-56 inclusive.

2. Between late July and October a high proportion of adult females acquired prominent white under tail-coverts or a prominent white mask during their post-nuptial moult. Some adult females possessed both features at the same time.

3. Juveniles aged between 5 and 12 weeks also acquired these features which, however, appeared neither so clean nor so extensive as in those adult females showing the maximum amounts of white in the same positions.

4. There is evidence that adult males acquired white under tail-coverts in their post-nuptial moult. The amount of white was less extensive than in adult females.

5. In relation to the features discussed, points are given concerning the possibility of confusing adult female Tufted Duck with adult female Scaup and Ferruginous Duck.\*

\*Plate 10 in the *Field Guide* may mislead. In this the white under tail-coverts of the Ferruginous Duck are marked with a pointer as a distinctive feature in identification, whereas the Tufted Duck on the same plate gives no indication that this feature may occur. This has already led to mistakes in identification.—EDS.



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## NOTES

**Impressions left by birds striking glass windows.**—In a previous issue of *British Birds* (vol. xlviii, plate 57) a photograph was published which showed the impression left by a pigeon (*Columba* sp.) on an aircraft which had struck it. Two similar photographs are now published (plate 56) showing the impressions left by two different birds on glass windows. The pigeon flew straight into a shop window in London in 1951, having obviously failed to see it, and killed itself. The impression of what was thought to be an owl (?*Strix* sp.), which flew into a window on the outskirts of Birmingham about 11 a.m. on 26th October 1950, clearly shows the braking effect of the wings. The feet have also been thrown forward as if to alight. Miss H. S. Houghton, who kindly sent the photograph—first published in *The Field* on 6th October 1951 (vol. 198, p. 552)—says that the bird's crash against the window was heard. "The bird was apparently unhurt, as all that was found on investigation was a few feathers. The impression, in what appeared to be a greasy dust or powder, remained on the window for several days, and did not entirely disappear until after the next visit of the window-cleaner." The distance between the wing-tips in this impression was about 20 inches, and in that of the pigeon in London a little over 21 inches.

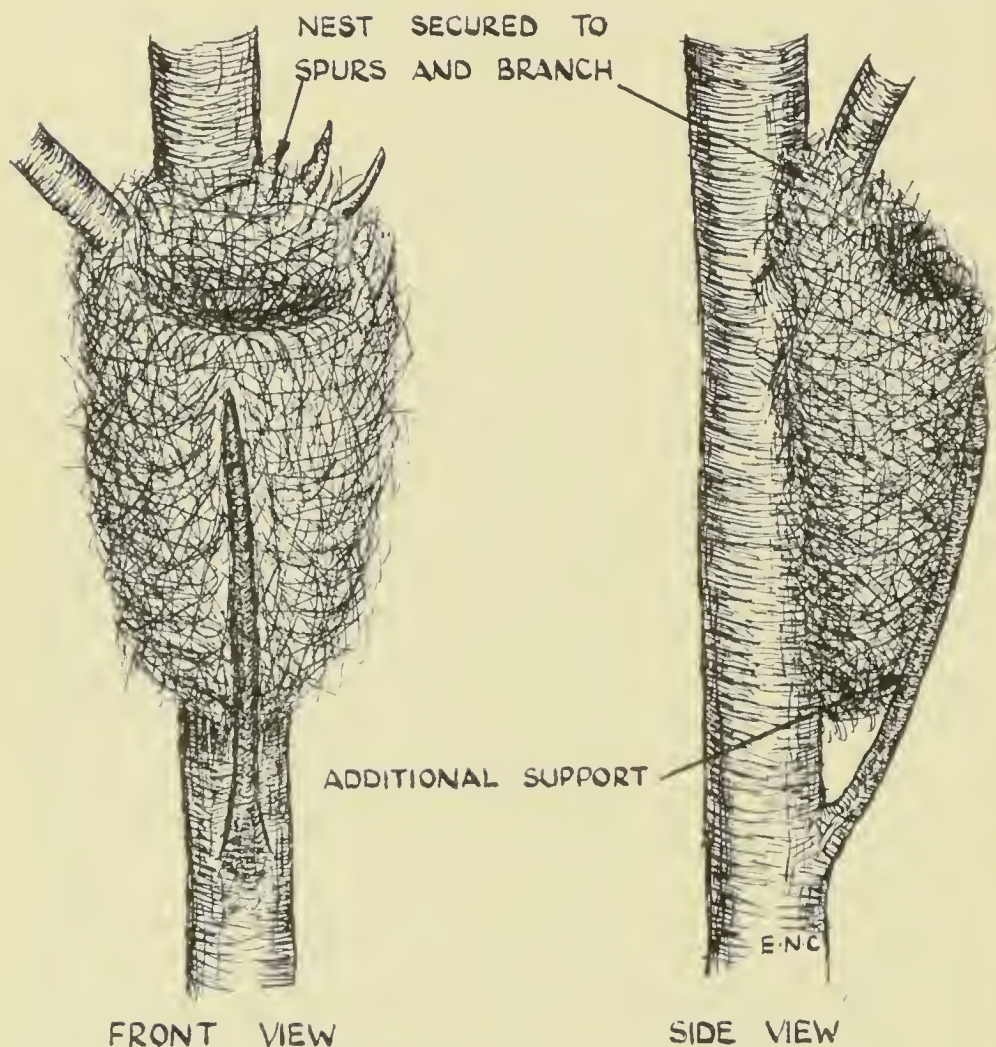
Miss Houghton's description suggests that the impression was caused by the bird's powder-down. This was thought to be the cause of the impression left by the pigeon on an aircraft. Even so, the clear impressions of the beak and eye in that photograph, and of the feet of Miss Houghton's bird here, are remarkable. Small birds, especially young birds, not seldom fly against windows with sufficient force to kill themselves, but without leaving any impression on the window. It seems likely that only larger birds with abundant powder-down can cause this ghost-like effect.

E. J. M. BUXTON

**An unusual tit's nest, probably of Blue Tit.**—On 17th November 1956, in Roddlesworth Wood, an upland plantation near Darwen, Lancashire, N.C. and M.H. saw a nest which appeared completely

strange to them. It was three feet from the top of a fourteen-foot-high sycamore sapling, near the edge of the plantation which comprises almost entirely young trees.

The nest was securely fastened to a lateral branch and to spurs, as well as being supported by an upturned spur in the manner shown in the accompanying sketch. The tree was free from scars or any other sign of disturbance; and when it was decided to collect the nest and submit it to A.H. at the Bolton Museum, it was necessary to tear it free from the twigs to which it had been securely fastened during its building.



NEST OF TIT, PROBABLY BLUE TIT (*Parus caeruleus*), AGAINST UPPER TRUNK OF SAPLING SYCAMORE: NEAR DARWEN, LANCASHIRE, 1956

The main body of the nest is of wool, hair and a moss (probably *Hypnum* sp.), with some bracken, feathers and shavings of bark. The lining has more hair, some of it human. It measures 4" in exterior depth, about 2½" in external diameter and about 1½" across the cup. The general condition of the nest and the degree

of soot-staining suggest that it was only a few months old and there is no detritus within the cup or around its edge to indicate that a brood was successfully reared in it.

By elimination, A.H. could only determine that the nest was that of a Blue Tit (*Parus caeruleus*), as it is too small for that of a Great Tit (*P. major*) and the other species are not normally present during the breeding season, although the Coal Tit (*P. ater*) occurs in winter and may occasionally nest. The nest was then sent to Major W. M. Congreve who very kindly replied, "There is nothing that could resemble the nest you sent except that of a small titmouse . . . My vote is for Blue Tit".

Although there is some dry-stone walling around the plantation, the tit population which the habitat can support is considerably in excess of the normal nesting accommodation. Two cases of open Blue Tit's nests in small trees have been recorded in *British Birds* (vol. xxxvii, p. 55; vol. xliii, p. 117), though each of these seems to have been in a real fork.

NOEL CURRIER, MICHAEL HOWORTH and ALFRED HAZELWOOD

[This nest was sent to us and we showed it, together with the above account, to Dr. J. A. Gibb and Dr. Monica M. Betts of the Edward Grey Institute, Oxford, in view of their special experience of the nests of tits. Dr. Gibb replied as follows:—"Considering only the nest itself and disregarding the habitat, we both think that it more closely resembles a Coal Tit's nest than a Blue Tit's: there is a surprising quantity of fur and hair for a Blue Tit's, and rather few feathers; against this, the shavings of bark are more typical of a Blue Tit. Taking the habitat into account, however, Blue Tit is the more probable. Great Tit is definitely ruled out, for the cup is too small; there is perhaps too much moss for Willow Tit (*P. atricapillus*); Marsh Tit (*P. palustris*) is conceivably possible, but this species would be even less likely to build in such a situation than the others." Remembering that all the species mentioned in the last sentence as unlikely possibilities are stated to be "not normally present" in the plantation concerned, it seems practically certain that the nest was built by a Blue Tit; particularly as Mr. Hazelwood has pointed out that the degree of smoke pollution in that area is such as to inhibit completely the growth of lichens, and even mosses are scarce and small, with the results that the local Blue Tits make a greater use of hair and bark shavings. However, it is perhaps impossible entirely to rule out the Coal Tit, except that this species is, in addition, much more prone to find a hole in the ground when more obvious sites are scarce. There are no old trees anywhere in the area and the Treecreeper (*Certhia familiaris*), which might otherwise be another possibility, is absent in the breeding-season—Eds.]

**Pallas's Grasshopper Warbler at Fair Isle.**—A small streaked warbler, clearly a *Locustella* sp., gave several fleeting views in the neighbourhood of the Haa at the southern end of Fair Isle



to R. Bruce Low and myself on 2nd October 1956. We could make out no helpful field-character as it skulked at the base of a dry-stone wall, into which, like a Wren (*Troglodytes troglodytes*), it occasionally disappeared; nor later, when it flitted from one heap of stones and slates to another, immediately in front of the house. We lost touch without having gained more than a general impression of warm brown upper-parts, heavily streaked with black, and a yellowish underside. When next we found the bird it was in the Heligoland trap behind the house, and we had no difficulty in securing it.

When taken from the box, the bird showed at a glance the whitish tail-spots of a Pallas's Grasshopper Warbler (*Locustella certhiola*), the third example for Britain and second for Fair Isle.

The upper-parts were generally warm brown, with some variation on head, nape and upper tail-coverts, and with black feather-centres giving a streaked appearance. The head inclined towards olive-brown, except for the fore-part of the crown, and the nape was distinctly greyer, contrasting with the upper mantle. The rump was comparatively unstreaked, and the upper tail-coverts were rufous, with the streaking accentuated. Ear-coverts were brown, lores greyish-white, and the slight eye-stripe was buffish-olive near its extremities but yellow above the eye. Chin and throat were primrose, the belly yellowish-white, and there was a brown-spotted buffish band across the breast. The under tail-coverts were a golden brown, the longest tipped with primrose. The tail was very worn with the middle feathers brown and lacking pale tips, and the rest blackish-brown with the abraded greyish-white tips most noticeable when viewed from the underside. The outer web of the 2nd primary was brownish-white and the fringes of the remaining remiges reddish-brown, the tertiaries having whitish tips to the inner webs. The fringes of the coverts tended more towards olive, and those of the bastard-wing were pale brown.

The wing-formula was: 3rd primary longest, emarginate; 2nd 4 mm. shorter; 1st slightly longer than the primary coverts; and 4th to 7th primaries shorter than the 3rd by  $2\frac{1}{2}$  mm.,  $5\frac{1}{2}$  mm., 8 mm. and 10 mm. respectively. The minimum wing-measurement was 66 mm. and the tail was 55 mm., the outer feathers being only 40 mm., the penultimate pair 45 mm., and the next pair 50 mm. There had been no moult of any of these feathers although the bird was clearly in its first winter (*cf. Handbook*, vol. ii, p. 36). The bill, from the skull, was 15 mm., and the tarsus 24 mm. and brownish-flesh in colour, though pink posteriorly, and with the claws pale horn. The irides were brown. At 15.7 gm. the bird weighed about 3 gm. more than the average for spring migrant Grasshopper Warblers (*L. naevia*), which have much the same range of measurements. Probably it had been several days on the island (James A. Stout had watched a similar *Locustella* a week or so before), or was passing through from Shetland in quiet weather. The bird was also seen in the laboratory by

Miss Janet McLellan, my wife and Iolo A. Williams.

We lost the bird soon after releasing it without having glimpsed the whitish marks at the tail-tip, though we looked hard for them; but as the bird flew from us we both noted the rufous, streaky rump, reminiscent of a Sedge Warbler's (*Acrocephalus schoenobaenus*). In recording the previous example (8th-9th October 1949: *antea*, vol. xliii, pp. 49-51) I commented on the unreliability of the tail-spots as a field-identification aid, and stressed the greater value of the reddish-brown area above the tail. If both were easier to see in the earlier bird, that is probably because the 1956 example gave only fleeting views, whereas the 1949 one was under close observation over a very long period. In any event, field-determination is highly critical, demanding a close view in excellent light, and bearing the *Handbook* description in mind it is worth while remembering that in young birds the underparts may be markedly yellowish, and the tail-tip much abraded. The suggestion under the "Field-characters" heading that "general plumage is much like Sedge Warbler" should not be taken too literally since the latter's prominent eye-stripe is at once sufficient to preclude confusion; but without a combination of care and good fortune any chance of distinguishing this species from the Grasshopper Warbler (especially young birds in autumn) is probably remote.

KENNETH WILLIAMSON

**Lesser Grey Shrike on Foula, Shetland.**—At dusk on 9th August 1956, Jim Gear of the Schoolhouse, Foula, Shetland, caught and correctly identified a Lesser Grey Shrike (*Lanius minor*) in my Heligoland trap in the kale-yard at Ham. The bird was an adult female in good plumage; it was very lively and was kept overnight in the house. In the morning it was examined by R. F. Dickens and myself, ringed and released. It flew off strongly and was watched perching on walls, posts and peat stacks. It made numerous sallies to the ground and on one occasion was seen to catch and eat what looked like a beetle at the foot of a peat-bank. Shortly after this it flew across the territory of an Arctic Skua (*Stercorarius parasiticus*) on the moor and was last seen being hotly pursued towards the hill.

On 12th August the bird was found dead on the beach at Ham close to where it was first trapped. The skin was preserved and is now in the Royal Scottish Museum in Edinburgh.

The measurements were as follows: weight (10 hours after trapping) 49 gm.; wing 117 mm.; tarsus 25 mm.; tail 96 mm.; bill from the base of crown 19 mm., and from feathers 16 mm. The breast and flanks were distinctly pinkish in tinge, though this faded quickly to a brown tint after the skin was preserved. The forehead was spotted with black, but there were if anything more grey than black tips to the feathers over the bill. C. K. MYLNE

**Linnets nesting socially in tufts of the Common Rush.**—During April and early May 1957, five pairs of Linnets (*Carduelis*

*cannabina*) nested socially in tufts of the Common Rush (*Juncus communis*) in a disused part of a gravel pit in the Isle of Ely. The nests were composed of stalks and thickly lined, to a depth of between a quarter and three-eighths of an inch, with down from ripe Reed Mace (*Typha latifolia*). The springiness and pressure of the rushes held the nests in position, there being little attempt, if any, at intertwining. Certain of the nests could be lifted out and replaced.

The gravel pit, with its profusion of weeds and flowers providing seeds and the moist ground and pools providing insects, is a rich feeding ground for finches. Nesting facilities in the locality, however, are limited, as many of the hedgerows and bushes had been uprooted during the previous twelve months. The Linnet has apparently adapted itself well to these local circumstances.

RONALD DRIVER

[Though Linnets nest exceptionally in tufts of heather (*Erica* spp.), we have not heard of any inland breeding-site comparable to the clumps of Common Rush described by Mr. Driver, but on the coast nests in Marram Grass (*Ammophila arenaria*) are not uncommon in some areas and occasionally they may be found in Sea Purslane (*Honckenya peploides*) on mud-flats.—Eds.]

## LETTERS

### SCIENCE AND THE BIRD-WATCHER

SIRS,—There has recently been some correspondence in *Bird Study* about a paper on "Line Transects". It has been suggested that that journal has been showing an increasing tendency towards publishing articles which are incomprehensible or of little interest to the ordinary bird watcher. We had hoped that *British Birds* would remain free from scientific "goonery"; but we see from recent issues that the magazine is beginning to appeal to the ornithologist rather than to the bird-watcher. We regard "bird-watcher" as meaning one whose interest in birds is not primarily scientific, but who finds in them relaxation or enjoyment, even, perhaps, in the despised sport of "tallyhunting"; the scientific bird-watcher is here termed "ornithologist". The papers to which we refer concern such subjects as feather-eating in grebes, the roosting-times of Nuthatches, bird-weights, and the mortality of the Blue Tit. The most recent example is Mr. D. F. Owen's paper on *Neottiphilum praeustum* (*antea*, pp. 160-164). Students of parasitology may find it a most revealing document; but *British Birds* does not exist for the benefit of parasitologists. It is, in fact, becoming increasingly difficult to see for whom it does exist. A statement of policy is surely required from the editors of both *Bird Study* and *British Birds*, so that readers and contributors should know the aims of both magazines, neither of which are at present catering for the bird-watcher; that is, for the man who does not approach birds in order to acquire scientific knowledge



and whose activities are necessarily limited to a week-end visit to the coast, sewage-farm or reservoir. The tendency among ornithologists has been to decry any form of "popular" bird-watching and to try to make an ornithologist out of the bird-watcher who has neither the necessary training nor the scientific bent. This has created an unreasonable guilt-complex in a number of people, who imagine that, in order to get anything out of their bird-watching, they must constantly be making random observations, the significance of which they do not understand; in particular there has arisen a school which accumulates statistics and plots graphs. In any case, it is difficult for the week-end bird-watcher to make any useful contribution to the science of ornithology, even if he is interested in doing so, except in so far as he can participate in a national survey or study local distribution.

It seems to us that in the face of this scientific onslaught *British Birds* should side with the bird-watcher rather than with the ornithologist; the latter is now well served by periodicals like *Bird Study* and *The Journal of Animal Behaviour*. We are not advocating a departure from high standards of scientific accuracy, but we would like to see some attempt at communicating the enjoyment and excitement of bird-watching, not just a record of bare facts. Here then are some suggestions.

It will, we think, be generally agreed that the papers which most interest the majority of bird-watchers are those on the broader aspects of migration, distribution and identification. For many of these subjects the article-form rather than the "paper" might be used. Second, the criterion for contributions should surely be their appeal, not to specialists in the Edward Grey Institute but to bird-watchers in general, and this criterion should be rigidly applied to random notes on behaviour, the omission of which would leave room for more popular material, such as articles of the "travelogue" type. One or two issues each year might be given to a "British Bird Report", summarizing the most interesting occurrences in each county, including those in Scotland and Ireland which at present appear only in their respective national journals.

In making these criticisms, we believe we are speaking not only for ourselves, but for a large number of fellow-birdwatchers, who although they greatly outnumber the true ornithologists, are not, like those, desirous of converting anyone to their own opinions, and rarely have the opportunity of stating their case in public. Bird-watching is a hobby as much as golf or tennis; the week-end golfer does not expect, on opening his sporting journal, to find a paper on the parasites that infect the clubhouse at St. Andrews or the behaviour of golf-balls in thermal air-currents.

G. L. SCOTT and D. K. BALLANCE

SIRS,—May a bird-watcher, who, in a busy life, has found

pleasure and relaxation in this hobby, say how completely he disagrees with Messrs. Scott and Ballance in their approach to their hobby and to the part that *British Birds* should have in it. On page 1 of the first volume H. F. Witherby wrote of the need to provide "a magazine into which all that is of interest concerning British birds should be gathered". This was his chief aim. I am at one with Messrs. Scott and Ballance when they suggest that papers incomprehensible to the great majority of readers of *British Birds* should not be published in this magazine; nor indeed are they. But why the amateur bird-watcher should not at the same time be what they call a true ornithologist, I cannot fathom. To suggest, as they do, that "the week-end bird-watcher" may find it "difficult to make any useful contribution to the science of ornithology" is manifestly incorrect if one considers the work of many such. One calls to mind the efforts of that great bird-watcher, Eliot Howard, who, in a busy life in industry, found time to write *Territory in Bird Life* and to bring a fresh mind to a study that had become rather stagnant. If he was not a bird-watcher, there never was one. Nor have those watchers who have employed their spare time from business or profession to the study of one species, such as that recently published on the Hawfinch, failed to make a really useful contribution to ornithology. And it is with work of this kind that *British Birds* has been fortunate enough to be favoured by various bird-watchers.

It is particularly difficult to understand the objection that Messrs. Scott and Ballance have to a most interesting article on parasites. Any week-end bird-watcher with the energy to find and examine a bird's nest may himself discover and accumulate data of great interest to him and of value to others; and that to do so is really interesting I can bear witness. A. W. BOYD

## NOTICES

**The XIIth International Ornithological Congress.**—We have received preliminary details of the Congress which will be held in Helsinki, Finland, in one of the residences of the Institute of Technology, from 5th to 12th June 1958. The price of a room in the dormitories will be about \$2 per person per day, food not included; the Congress fee will be about \$10. The prospectus, containing registration form and detailed information, will be distributed about the beginning of October 1957.

During the Congress, two one-day excursions will be arranged. Before and after the Congress (31st May-4th June and 13th-24th June), longer excursions will be made to various representative places in Finland, including its northernmost parts.

Applications to attend the Congress, and to contribute scientific papers, should be sent in before 28th February 1958, and addressed to the General Secretary (Dr. Lars von Haartman), who is ready to answer any enquiries. His address is the Zoological Institute, University of Helsinki, Finland.

**Ceremony on Heligoland.**—On Saturday, 7th September 1957, the Heligoland Bird Observatory is holding an opening ceremony for its new building and observation tower on the island. There will be an address on the Bird Observatory's past and present by Dr. R. Drost, the Director, to whom we extend greetings and good wishes for the occasion.

PURCHASED

6 SEP 1957

## NOTICE TO CONTRIBUTORS

*British Birds* publishes material dealing with original observations on the birds of Britain and Western Europe, or where appropriate, on birds of this area as observed in other parts of their range. Except for records of rarities, Papers and Notes are normally accepted only on condition that the material is not being offered to any other journal. Photographs (glossy prints showing good contrast) and sketches are welcomed. Proofs of all contributions accepted are sent to authors before publication. After publication 20 separates of Papers are sent free to authors; additional copies, for which a charge is made, can be provided if ordered when the proofs are returned.

Contributors are asked to observe the following points, attention to which saves the waste of much editorial time on trivial alterations:

1. Papers should be typewritten with double spacing, and on one side of the sheet only. Shorter contributions, if not typed, must be clearly written and with similar spacing. Failure to help in this way may result in delays to publication.

2. Notes should be worded as concisely as possible, and drawn up in the form in which they will be printed, with signature in block capitals and the writer's address clearly written on the same sheet. If more than one Note is submitted, each should be on a separate sheet, with signature and address repeated. In the case of rarity records, any supporting description which is too detailed for publication should be attached separately.

3. Certain conventions of style and lay-out are essential to preserve the uniformity of any publication. Authors of Papers in particular, especially of those containing Systematic Lists, Reference Lists, Tables, etc., should consult the ones in this issue as a guide to general presentation. English names of species should have capital initials for each word, except after a hyphen (e.g. Siberian Thrush, Yellow-headed Wagtail), but group terms should not (e.g. thrushes, wagtails). English names are those used in *The Handbook of British Birds*, with the exception of the changes listed in *British Birds* in 1953 (vol. xlv, pp. 2-3). The scientific name of each species should be given (in brackets and underlined) immediately after the first mention of the English name. Sub-specific names should not be used except where they are relevant to the discussion. It is sometimes more convenient to list scientific names in an appendix. Dates should take the form "1st January 1955" and no other, except in Tables where they may be abbreviated to "1st Jan.", "Jan. 1st", or even "Jan. 1", whichever most suits the lay-out of the Table concerned. It is particularly requested that authors should pay attention to Reference Lists, which otherwise cause much unnecessary work. These should take the following form:

TUCKER, B. W. (1949): "Species and subspecies: a review for general ornithologists". *Brit. Birds*, xlii: 129-134.

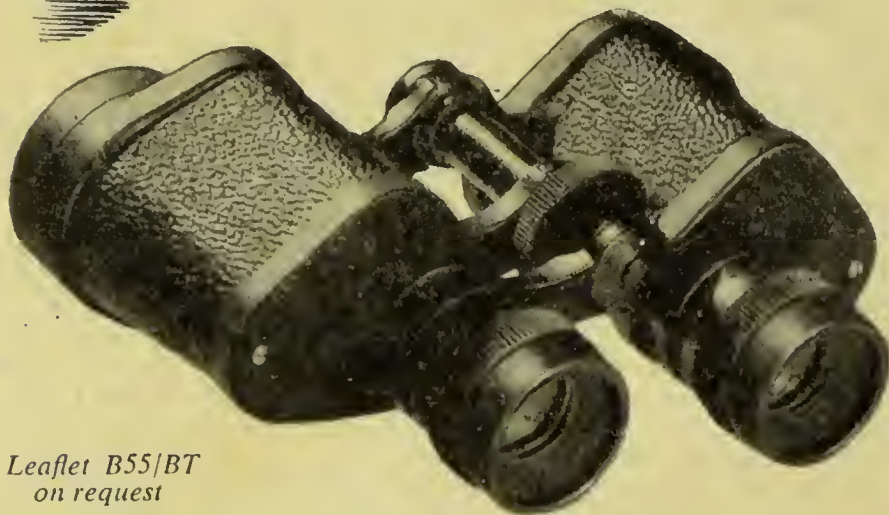
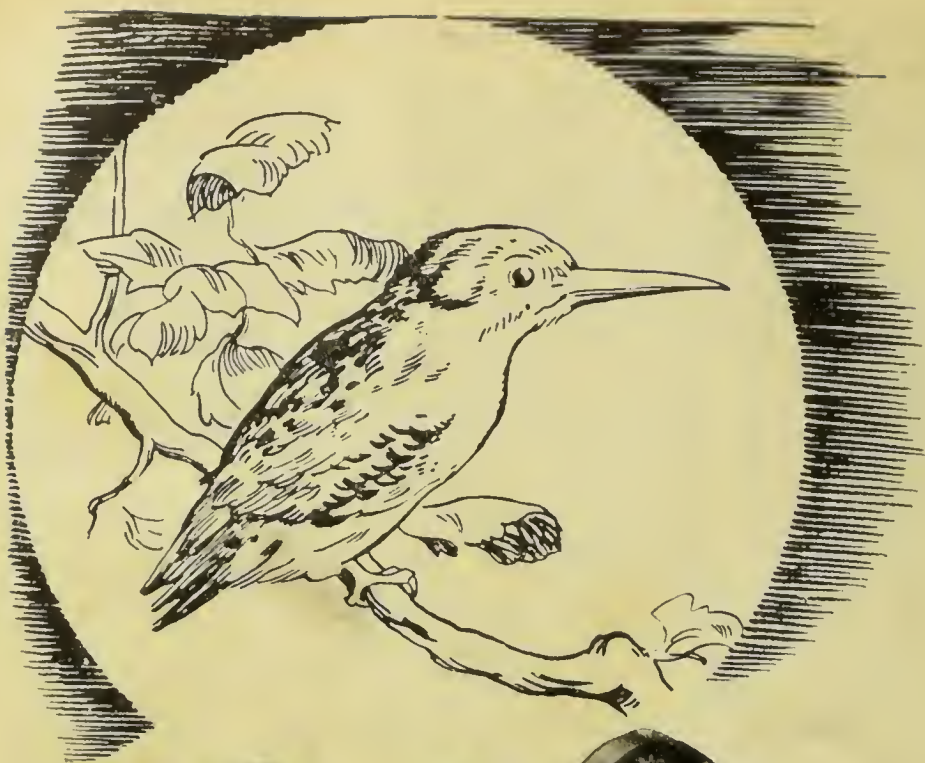
WITHERBY, H. F. (1894): *Forest Birds: Their Haunts and Habits*. London. p. 34.

Various other conventions concerning references, including their use in the text, should be noted by consulting previous examples.

4. Tables should be numbered with Roman numerals, and the title typed above in the style used in this issue. The title and any headings within the Table should not be underlined, because this sometimes makes it difficult for the Editor to indicate the type to be used. It is most important that the lay-out of each Table should be carefully planned with an eye to its final appearance; above all, it should be borne in mind that Tables must either fit into the width of a page, or be designed to fit a whole page lengthways. All Tables should be self-explanatory.

5. Figures should be numbered with Arabic numerals, and the captions typed on a separate sheet. All line-drawings should be in Indian ink on good quality drawing paper (not of an absorbent nature) or, where necessary, on graph paper, but this must be light blue or very pale grey. It is best if maps, graphs, etc., are drawn twice the size of the final reproduction (ideally, therefore, for the normal 4" width the original should be 8" wide); sketches of birds, however, should be only slightly larger than the size at which it is intended they should appear. It is always most important to consider how each drawing will fit into the page. The neat insertion of lettering, numbers, arrows, etc., is perhaps the most difficult part of Indian ink drawing and, unless he has had considerable experience of this kind of work, an author should seek the aid of a skilled draughtsman. The publishers regret that, owing to rising costs, it will in future be only in exceptional cases that they can undertake to have lettering inserted.





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# BRITISH BIRDS



OCTOBER 1957

THREE SHILLINGS



# BRITISH BIRDS

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## CONTENTS OF VOLUME L, NUMBER 10, OCTOBER 1957

	PAGE
A review of the anting-behaviour of Passerine birds. By K. E. L. Simmons. Photographed by Bernard Corby, Hans Löhrl and Bruce R. Young (plates 57-62) ... ..	401
The status of the Pied Flycatcher and the Tree Pipit in Ireland. By P. W. P. Browne and Major Robert F. Ruttledge ... ..	424
Social flying of Ravens. By Raymond Hewson ... ..	432
Obituaries: Arthur Brook (1886-1957) ... ..	435
Norman Boyd Kinnear (1882-1957) ... ..	436
Averil Morley (1913-1957) ... ..	437
 Notes:—	
A second unusual nest of Black-throated Diver (M. D. England) (plate 63) ... ..	439
Feeding association between Bewick's Swan and Mallard (Bernard King) ... ..	439
Mediterranean Black-headed Gulls in Sussex (C. M. James and C. M. Veysey) ... ..	440
Swallow's nest with eleven eggs (J. H. Owen) ... ..	441
Starlings alighting on ship from the United States (Guy Mountfort) ... ..	441
The behaviour of House Sparrows in the presence of ants (T. Seabrook; K. E. L. Simmons) ... ..	442
 Reviews:—	
<i>Twentieth Century Bestiary</i> . By various authors. ... ..	443
<i>Acta Vertebratica</i> , Vol. I, No. 1. Edited by Kai Curry-Lindhal, Bertil Hanström and Bertil Kullenberg ... ..	444
 Letters:—	
"Harlequin Duck in Shetland" (Prof. V. C. Wynne-Edwards) (plate 64) ... ..	445
Is the photography of birds an evil? (G. R. Shannon) ... ..	447
Cormorants and Shags "drying" their wings (Frank Stabler) ... ..	447

Cover photograph by Harold R. Lowes: Treecreeper (*Certhia familiaris*)



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## BRITISH BIRDS

### A REVIEW OF THE ANTING-BEHAVIOUR OF PASSERINE BIRDS

By K. E. L. SIMMONS

(Plates 57-62)

#### INTRODUCTION

ANTING-BEHAVIOUR may be defined as the stereotyped movements with which birds, in order to get formic acid (or other organic liquids) on to the feathers for some purpose as yet not fully understood, actively apply ants (or objects in place of ants) to certain parts of the plumage, and/or more or less passively allow these insects to crawl on to the plumage.

Bird-watchers in the British Isles have so far lacked a readily available general review of this enigmatic behaviour. The present paper aims to provide detailed descriptions of the special movements involved (with the aid of illustrations) and to discuss the nature of anting critically.

*The literature of anting and the basis of the present review.*

No attempt will be made to trace fully the earlier history of anting in the literature. Those interested can do no better than read the account of Chisholm (1944), to whom all credit is due for first stimulating widespread interest in this very puzzling phenomenon in his book on Australian bird topics (1934). Before this, there were only scattered references (e.g. Osmaston (1909) who gave the first details of certain features of anting), but, as a direct result of Chisholm's comments, there appeared, in the German periodical *Ornithologische Monatsberichte*, a series of preliminary notes, initiated by the editor Dr. E. Stresemann (Stresemann, 1935; Stresemann *et al.*, 1935; Adlersparre, 1936; and others). Another contribution at this time came from India (Ali, 1936), after which for some years most interest in anting was shown in North America, mainly through the medium of *The Auk*. After McAtee (1938) had written the first general review, papers and notes greatly multiplied. The most valuable of these are by Ivor (1941, 1943), based on an unrivalled amount of first-hand information of anting in aviary birds, while other American papers

which have added appreciably to our knowledge of the subject are those of Nice and ter Pelkwyk (1940), Nice (1943), Brackbill (1948) and Groskin (1950). In recent years, further contributions have appeared in Europe, including major reviews by Wackernagel (1951), van IJzendoorn (1952) and Poulsen (1956a and b). In Britain, the most important papers are those of Goodwin (1953, 1955b, 1956); otherwise, in spite of Chisholm's (1944) review in *The Ibis*, anting-behaviour has received little detailed attention here, most contributions taking the form of short notes in *British Birds*. An interesting summary was included by Rothschild and Clay (1952) in their book on bird-parasites and one of the most recent additions to the anting-literature is an attractive paper by Ivor (1956), illustrated by colour flash-photographs.

As the bibliography shows, the literature on anting is a large one. Out of it all, the works of Ivor, of Goodwin (also 1951, 1952, 1955a) and of Poulsen are of the most value, being based on very close study of numerous species in captivity. My debt to those authors is particularly great in preparing this review. I have also, however, been able to draw on my own experiences of anting. This has been mainly with my captive Pekin Robins (*Leiothrix lutea*) though I have also had the opportunity of watching a further twenty or so species, chiefly while accompanying Derek Goodwin at the London Zoo. Full acknowledgements are made at the end of the paper.

#### SOME GENERAL ASPECTS

True anting seems entirely confined to the Passerines. In 1943, Nice traced records for nearly forty species of thirteen families; in 1952, van IJzendoorn for over sixty species of eighteen families, and in 1956, Poulsen for nearly 110 species of twenty-four families, of which he himself was responsible for no less than over forty new records. The behaviour is most common in the crows (Corvidae), starlings (Sturnidae), troupials or hang-nests (Icteridae), finches (Fringillidae), weavers (Ploceidae), thrushes (Turdidae) and babblers (Timaliidae). However, even in these groups the behaviour is not shown by all members, and there are some whole families which apparently never "ant", for example the larks (Alaudidae), tits (Paridae) and warblers (Sylviidae). An annotated list of those British and other European species that have been recorded as anting is given on pages 413-415. Anting has also been reported from the woodpeckers (Piciformes), but confirmation is needed of this as no authority, either on anting or on woodpeckers, has recorded the behaviour from this group. The problem will be discussed in more detail later (p. 412). The game-birds (Galliformes) are supposed to "ant" too, but Goodwin (1955b) points out that here we have to avoid confusion with misinterpreted dust-bathing in ant-hills. Poulsen (1956b) confirms this. He gave fifteen individuals of six game-bird species, representing six genera, the opportunity to "ant", but none did

so though all ate the insects. Partridges (*Perdix perdix*) and Quail (*Coturnix coturnix*) were among the species studied.

There are two major types of anting, active-anting and passive-anting, the main differences between the two being that, in the former, the bird normally applies crushed ants directly to certain parts of its plumage with the bill, whereas, in passive-anting, it usually assumes a special posture in order to allow live ants to crawl over it. These variations are not absolute; intermediate behaviour occurs and birds that are passive-anting will perform active-anting movements at the same time. Before describing these activities in detail, the general relationship of birds with ants should first be examined briefly.

In the British avifauna, only two species, the non-Passerine Wryneck (*Jynx torquilla*) and Green Woodpecker (*Picus viridis*), are regular eaters of ants. Probably no Passerine relies on them to any great extent as major items of diet, although many will at least occasionally consume even the workers, will pay special attention to swarms of winged ants and will eagerly eat the pupae ("ant-eggs") if given an opportunity. Here, we are mainly concerned with the worker-ants which produce acid (as also do the less numerous queens, though the male ants are harmless). All the evidence suggests that birds will eat worker-ants only if other, more desirable, food is not readily available. However, we do urgently need further observations on ants as food and these are not easy to make under field-conditions; moreover, work on aviary birds, which usually do not get a fully natural diet and cannot forage normally, may be misleading in this particular case. Theoretically, it might be supposed that worker-ants would be protected to some extent from predation by the formic acid they manufacture internally and secrete. Indeed, the work of Palmgren *et al.* (1937) and of Steiniger (1937) did indicate that workers were avoided by birds because of their distastefulness. Robins (*Erithacus rubecula*), one of the species observed in captivity, approached the ants, showed interest in them but would not touch them. Evidence such as this led Heikentinger (1954) to state that the avoidance of worker-ants is absolute. However, Poulsen has recently found that captive Robins will eat ants readily on occasions, even workers of the large Wood Ant (*Formica rufa*), which shows that the avoidance is only relative.

Birds' reactions to worker-ants vary. For example: some species, such as the Robin, pick them up rapidly and swallow them immediately without nibbling them first and apparently without ever anting with them (Poulsen, 1956b); others, such as the Jay (*Garrulus glandarius*), never eat the workers but do "ant", while many Passerines both consume them and perform anting. Feeding and anting frequently occur together, but this is by no means always so. It must be remembered that observations on birds anting in captivity are done in rather artificial circumstances which might bias one into stressing too greatly the connection



between anting and feeding. In the wild, birds are not often confronted with an upturned ant-colony—nest debris, very edible pupae and males, queens and workers together. Sometimes birds will approach worker-ants specially to “ant” with them, often discarding them afterwards, which suggests that anting is, in fact, independent of feeding. This point is further discussed on pages 416-417.

Worker-ants of several species squirt acid at their foes. The largest British species, the Wood Ant, stands up, brings its abdomen forward between the legs and directs a jet of formic-acid as far as six to twelve inches (Imms, 1947). Normally, birds are well protected by their feathers against this form of attack, which in any case is mainly designed to deal with other insects, not vertebrates. On occasions, however, this acid reaches the area of a bird's eye when it is feeding or anting. The most common reaction to this unpleasantness is the characteristic “shoulder-rubbing” movement (Goodwin, 1955a), the head being flicked down to the shoulder in order to rub the eye against it. This behaviour is not a special movement connected only with anting. Species of many orders which do not “ant” show it when any irritation, such as dust or dirt, affects the eye. Less commonly, birds with acid in the eye may wipe the side of the head on a branch or scratch with the foot. At other times, a bird will leap back, shaking the head and blinking the eye. Birds are less perturbed when squirted on the legs, but Poulsen (1956b) notes that they may shake their legs, jump, and pick off those ants on the tarsi to fling them away.

#### DESCRIPTION OF ANTING-BEHAVIOUR

*Active-anting* (Figs. 1-2, plates 57-61).

The majority of those Passerine species that “ant” do so actively. The movements by which they do so are performed so rapidly that the details are very hard to follow, especially at a distance in the field. Indeed, most field-notes on anting tend to be rather vague, incomplete and, in some cases, inaccurate. This is no reflection on the observers themselves but on the extreme difficulty of noting down exact details, especially for those not familiar with anting-behaviour. Thanks now to the patient observations of several ornithologists on captive birds, and to the flash-photographs in Ivor (1956), these superficially very complex movements are revealed as relatively simple and stereotyped. Most Passerines adopt a characteristic posture as they apply ants along the underside of the wing (on the outer primaries mainly) and also, though perhaps less frequently, under the tail (again chiefly on the outer rectrices). Some crows and Purple Grackle (*Quiscalus quiscula*: Family Icteridae) excepted, it is extremely doubtful whether any other birds rub ants on additional parts of the body, such as the contour-feathers, as some field-observations have indicated but no anting authority confirmed.

Ivor (1956), who has observed anting on thousands of occasions (sometimes even on his hand) and who has studied 250 flash-photographs (some of which are published here), never once saw ants being applied to the body. He tells also (1943) how he observed Wood Thrushes (*Hylocichla mustelina*) go through the actions of rubbing ants on the breast, belly and flanks before or after the typical movements on wings and tail. Close watching showed, however, that the birds did not actually touch the feathers. Further, no species is known for certain to place live ants deliberately in the feathers with the bill, as has been maintained by some observers.

Birds "ant" extremely rapidly, then, and with marked concentration when performing at full intensity. They may continue the behaviour for several minutes, sometimes as long as half-an-hour. Many species show no obvious fear when approaching the ants and picking them up, but a few tropical birds are cautious. A typical anting-sequence proceeds like this. The bird seizes a worker-ant in the tip of its bill, at almost the same instance contorting with swift movements into the anting-posture. One wing is lifted forward and sideways away from the body, carpal raised, the primaries spread and often brushing the ground. The tail is usually opened a little and jerked forward to the same side as the raised wing, sometimes so vigorously and so completely that the bird loses its balance, especially if it treads on it. Still in the very second that it picks up the ant and twists itself into position, the bird strokes the insect with a fast, flicking action down the underside of the extended wing, moving from near the base of the feather to the tip. In Ivor's experience (1956), only the ant and perhaps the tip of the bill come into contact with the feathers, but Poulsen (1956b) found that parts of the head are sometimes also rubbed among the feathers. A series of strokes may be made under one wing, one primary feather being dealt with at a time, and then attention given to the other wing; or the bird may alternate more frequently from wing to wing. As may clearly be seen in Fig. 1, the angle of the outer primary feathers is often changed from the normal so as to present them edge-ways for easier treatment. The tail is also dealt with, the same actions being used in anointing the rectrices as with the flight feathers. Whether the tail happens to be stroked or not, it is usually contorted all the same, sometimes in rhythm with the rubbing movements on the wing; similarly, while the bird treats the tail, it still holds out the wing.

Ivor (1943) stated that the bird half-closes the eyes when anting and later (1956) showed that the nictitating membranes also flick across, as I also observed (Simmons, 1955). Ivor considers that this habit protects the eyes against formic-acid and against contact with the feathers.

There are variations in this typical anting procedure. Whereas the ant is usually crushed before being used, so that the acid-

glands are ruptured, intact insects are also sometimes employed. Most birds bite the ant quickly and then use it immediately, but a few nibble it carefully first. Some birds use only one insect for a single stroking movement; others perform several rubs at a



FIG. 1—ACTIVE-ANTING BY AMERICAN ROBIN (*Turdus migratorius*)  
(Drawn by Robert Gillmor from a flash-photograph by Bruce R. Young)

Both this bird and the Starling (*Sturnus vulgaris*) shown in Fig. 2 are in the typical anting posture with one wing raised, tail spread and brought forward; the nictitating membranes are drawn across the eyes. Both birds are applying ants to the tail (the American Robin with one insect in its bill, the Starling with several); when ants are being applied to the wing, this is held more fully away from the body than shown here.

time before getting a fresh one. Most use a single ant; a few collect several and use them all at once. Many remain among the ants while performing; others are more cautious and retire to a perch. Many eat at least some of the ants used; a few discard them after. While some of these differences are individual, most are probably specific. For instance, Pekin Robins nearly always use a single ant for a series of movements and Starlings (*Sturnus vulgaris*) always "ant" with a ball of crushed insects (Fig. 2), as



often do the Magpie (*Pica pica*) and Blue Jay (*Cyanocitta cristatus*). Poulsen points out that there are not wide individual differences in anting-behaviour. Most of those that do occur are intensity variations. Thus, sometimes the full anting-posture is not assumed or,



FIG. 2—ACTIVE-ANTING BY STARLING (*Sturnus vulgaris*)  
(Drawn by Robert Gillmor from a flash-photograph by Bruce R. Young)  
See caption to Fig 1.

while the wing-movements are complete, the tail may not be brought forward. Often, too, birds which usually eat ants while anting may reject them during particular spells. In fact, it seems very probable that rejection of the ants is, at least in those species which also eat ants, a sign of really high-intensity anting (see pages 416-417).

Unlike all other Passerines but the Purple (Bronze) Grackle, some corvids rub ants on other regions of the body in addition to the conventional areas. The Magpie, for example, "ants" on the rump, base of the tail and in the area of the vent (Goodwin, 1953; Simmons, 1955). The Purple Grackle has a very characteristic manner of anting. It rubs ants among the feathers of the breast,

scapulars, rump and upper tail-coverts (Brackbill, 1948; Poulsen, 1956b), seeming to "dig" into the plumage with the insect in its bill, as when really preening, rather than to make the typical stroking anting-actions. It usually discards the ants afterwards, tossing them away as other troupials have been seen to do.

Some species bring forward both wings when anting. Poulsen (1956b) records this from the Blue Sugarbird (*Dacnis cayana*: Family Coerebidae). "This species picks up an ant in its bill, and very rapidly it rises in an almost vertical position with spread tail and moves both wings forward so that they touch each other while quivering, and the head is moved downwards among the tips of the wings". The sugarbird does not bring the tail forward while anting. The Azure-winged Magpie (*Cyanopica cyanea*) also regularly advances both wings simultaneously (Goodwin, 1953) and the Blue Jay does so occasionally (Poulsen, 1956b), though otherwise both species "ant" normally.

*The anting-behaviour of the Jay* (see Fig. 3 and plate 62).

Our own Jay, and a few other foreign corvids, have anting-movements quite distinct from those of other Passerines (Goodwin, 1951, 1952, 1953):—

"The main difference is that the common Jay does not pick up ants in its bill whilst anting (except sometimes to pluck them from its legs and cast them aside) although it makes the same movement of running its bill down the inner edges of its primaries and



FIG. 3—SPECIAL FORM OF ANTING BY THE JAY (*Garrulus glandarius*), INTERMEDIATE BETWEEN ACTIVE AND PASSIVE TYPES

(Drawn by Robert Gillmor from a photograph by Hans Löhrl)

This species brings both wings forward to allow the ants to swarm up over its plumage. Although the Jay makes movements with its bill along the underside of its wings, it does not in fact hold an ant while doing so. The tail is often brought forward as in other Passerines.

secondaries as birds that do" (1952). "Both wings are thrust forward at once, the primaries brushing the ground, and (at high intensity) almost fully spread, so that they form a tent around and in front of the bird. This bringing forward of the wings is accompanied by a convulsive shuddering movement" (1953). "Needless to say, before the anting has gone very far the Jay's whole plumage is a seething mass of ants which have swarmed up legs, wings and tail. How the bird can stand it is astonishing, and indeed its whole demeanour suggests a scarcely bearable irritation" (1951).

Only the Green Magpie (*Cissa chinensis*) and the Red-billed Blue Magpie (*Urocissa erythrorhyncha*) are known to "ant" in

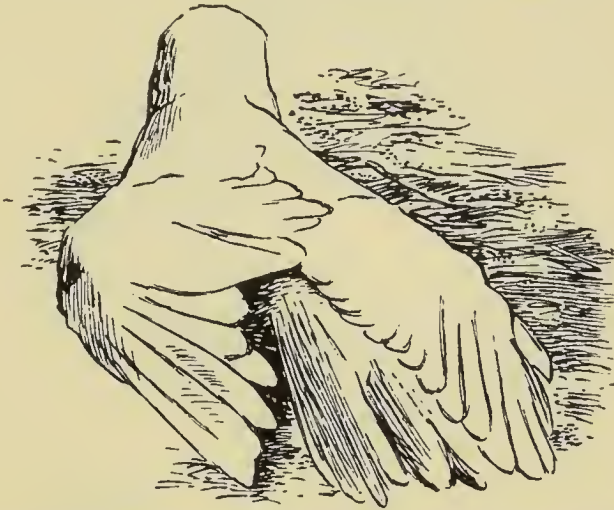


FIG. 4—PASSIVE-ANTING BY CARRION CROW (*Corvus corone*)

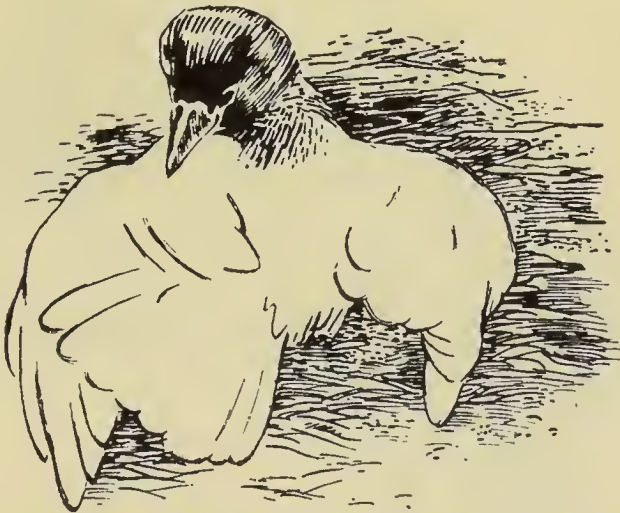


FIG. 5—PASSIVE-ANTING BY CARRION CROW (*Corvus corone*)

(Both figs. drawn by Robert Gillmor from photographs by Hans Löhrl; mainly in outline in order to show posture clearly)

The bird lies down among the ants with wings and tail spread (often more fully than shown here) and allows the insects to swarm over it. The bird in Fig. 5 is possibly applying an ant to its rump, as this species is known to do.



the same way. All three species often bring the tail forward, though not invariably. Anting in the Jay has also been studied (with photographs) by Löhrl (1952, 1956).

*Passive-anting* (see Figs. 4-8).

While, strictly speaking, the behaviour of the Jay comes under this category, typical passive-anting differs appreciably. It has only been recorded from a minority of larger Passerines, mainly crows and thrushes of the genera *Corvus* and *Turdus* respectively, all of which also "ant" in the active manner, with the possible exception of the American Crow (*Corvus brachyrhynchus*).

The Carrion and Hooded Crows (*C. corone* and *cornix*) and the Rook (*C. frugilegus*) "wallow" in ants, flopping, grovelling and lying still among them with the wings outspread, tail raised or pressed down (Figs. 4 and 5), allowing the insects to swarm over (see, for example, Wackernagel, 1951; Goodwin, 1953, and Löhrl, 1956). Those thrushes that have been reported "ant-bathing" in a somewhat similar fashion include the American Robin (*T. migratorius*), Song Thrush (*T. philomelos*) and Redwing



FIG. 6—PASSIVE-ANTING BY AMERICAN ROBIN (*Turdus migratorius*)  
(Drawn by Robert Gillmor from a flash-photograph by Bruce R. Young)

This bird is showing the intention of anting passively, bringing forward both wings before settling down among the ants.

(*T. musicus*) (Poulsen, 1956b; and others). Apparently, Starlings may occasionally show this form of anting, judging from a single field-observation (Baggaley, 1946).

A certain amount of active-anting sometimes accompanies the passive (and also often precedes and follows it). Poulsen's thrushes applied ants to the wing and tail while ant-bathing but the full active-anting posture with wing raised does not seem to appear, so perhaps only lower intensity active-anting is connected with the passive. More observation is needed.

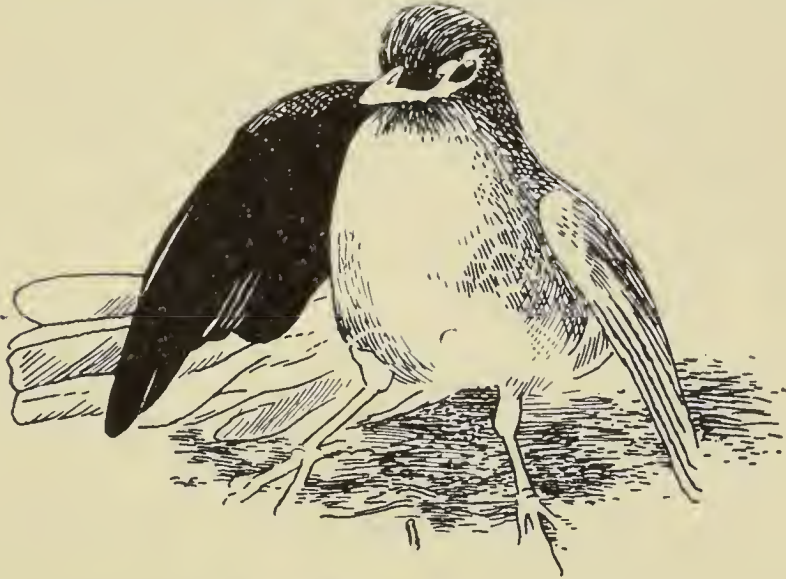


FIG. 7—PASSIVE-ANTING BY AMERICAN ROBIN (*Turdus migratorius*)

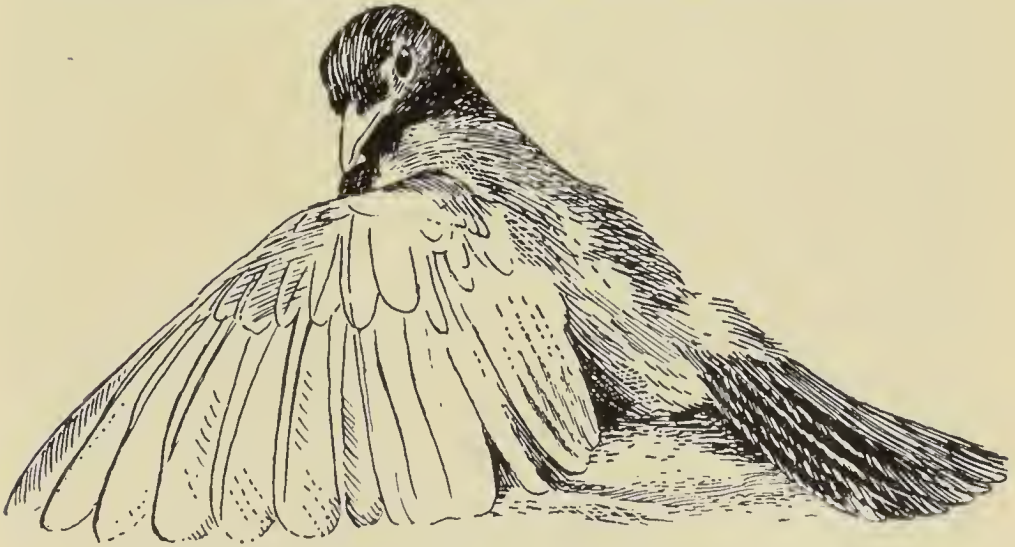


FIG. 8—PASSIVE-ANTING BY AMERICAN ROBIN (*Turdus migratorius*)

(Both figs. drawn by Robert Gillmor from photographs by Holger Poulsen)

In Fig. 7, the bird is bringing forward both wings (a characteristic passive-anting movement), but also has its tail advanced (typical of active-anting). In Fig. 8, it has settled down more fully among the ants. Passive-anting may often be accompanied by a reduced form of active-anting.

*Further aspects.*

After active-anting especially, the bird usually wipes the bill carefully. Ivor (1943) noticed no normal preening after anting, but Goodwin (1955b, 1956) stresses that preening and bathing in water often follow and this is my experience with the Pekin Robin. Brackbill (1948) also observed preening following anting in the Purple Grackle. Poulsen (1956 and *in litt.*) saw neither bathing nor preening, however. All this is very puzzling and more work is needed.

Several authors have commented on the almost trance-like state of anting birds and their peacefulness. This situation seems mainly due to the great intensity of the anting performance and no greater significance than this need be attached. In fact, there are quite a few records of aggressiveness during anting: Williams (1948) observed squabbles in wild Starlings, Brackbill (1948) song and threat from wild Purple Grackles, while Poulsen's thrushes drove away other birds that came near them. Derek Goodwin tells me that dominant Jays have precedence over subordinates at the ant heap, often driving them away.

## DO WOODPECKERS ANT?

Now that full descriptions of all true anting-behaviour have been put before the reader, the question whether anting does really occur in the Piciformes may be further examined. No expert on this group has yet recorded the behaviour while Groskin (1943) and Poulsen (1956b) observed that flickers (*Colaptes auratus* and *C. agricola*) ate ants without attempting any form of anting. The only records of woodpeckers performing are based on field-observation of the Green Woodpecker (Allsop, 1949; Standford, 1949) and the Wryneck (Stone, 1954). I believe that the birds concerned were not anting and this is also implied by Goodwin (1956) and Poulsen (1956b). Both these species are regular eaters of ants and it is understandable that misinterpretation of some behaviour other than anting should have occurred. The two Green Woodpecker records agree that ants were applied to the breast and under the wings, while the birds were feeding on the insects. In addition, Standford's bird called loudly. It seems possible that both birds were, in fact, picking ants off their bodies and "shoulder-rubbing" (see p. 404) after being squirted with acid, the one bird crying out in pain. (A sequence of a Green Woodpecker "shoulder-rubbing" appears in Heinz Sielmann's fine film on woodpeckers.) In the case of the Wryneck, the bird was shuffling along the ground with half-open wings and tail, apparently rubbing something into its plumage with the bill. Mr. Stone (*in litt.*) informs me that the day in question was extremely hot. It seems possible that his bird was trying to sunbathe but was inconvenienced by ants which it picked off its plumage.

## ANTING BY PASSERINES ON THE BRITISH LIST

Out of over 170 species of Passerines on the British List, only



twenty have so far been recorded as anting and, of these, only ten species have been observed anting within the geographical boundaries of the British Isles. Such native British records have been indicated by an asterisk in the systematic list below. I have also indicated under each species whether observations have been made on its anting in wild or captive birds, where this is known.

There are no records from any part of the world for any species of the following families represented on the British List:—Oriolidae (orioles), Alaudidae (larks), Certhiidae (creepers), Sittidae (nuthatches), Paridae (tits), Laniidae (shrikes), Regulidae (kinglets), Sylviidae (warblers), Prunellidae (accentors), Troglodytidae (wrens), Hirundinidae (swallows). Neither has any European species of Muscicapidae (flycatchers) nor of Bombycillidae (waxwings) been recorded as anting, though two Asiatic flycatchers of the genus *Niltava* (closely related to *Muscicapa*) and the Cedar Waxwing (*Bombycilla cedrorum*) of N. America are known to perform. The records of anting are as follows:—

### Family CORVIDAE

*Recorded from fourteen species of which six are on the British List.*

RAVEN (*Corvus corax*).—Only active-anting recorded, apparently (Jacobsen, 1911; cited by van IJzendoorn, 1952).

\*CARRION CROW (*C. corone*).—Both passive and active-anting observed, in captivity and in the wild (Lorenz, 1936; Condry, 1947; Wells, 1950; Goodwin, 1953; Simmons, pers. obs.; and especially (with photographs) Wackernagel, 1951; and Löhrl, 1956).

\*HOODED CROW (*C. cornix*).—So far only passive-anting recorded from captive birds by Heine (1929) and Coombs (1947).

\*ROOK (*C. frugilegus*).—Both main forms of anting noted in the wild and in captivity (Chappell, 1949; Goodwin, 1953; Simmons, pers. obs.).

\*MAGPIE (*Pica pica*).—A most interesting species which apparently only "ants" actively, often collecting several ants in the bill at once. Tame Magpies have been known to use burning tobacco. Anting recorded both in the wild and in captivity by Heinroth (1911), Chisholm (1944), Reynolds (1946), Schierer (1952), Goodwin (1953) and Simmons (1955).

\*JAY (*Garrulus glandarius*).—The peculiar behaviour of this species has been observed in both wild and captive individuals. Full details and references are given on pp. 408-409. Goodwin mentions that sometimes a Jay will "ant" rather clumsily and ineffectively amongst the foliage of trees.

### Family STURNIDAE

*Anting recorded from eleven species of which two are on the British List.*

\*STARLING (*Sturnus vulgaris*).—There are numerous accounts of active-anting by this bird, both in the wild and in captivity, including Tebbutt (1946), Gregory (1946) and Williams (1948). Passive-anting apparently occurs rarely (see Baggeley, 1946), but further observations are needed.

ROSE-COLOURED STARLING (*S. roseus*).—Active-anting seen from two captive individuals in the Copenhagen Zoo (Poulsen, 1956b).

### Family FRINGILLIDAE

*Anting recorded from twenty species of which three are on the British List.*

HAWFINCH (*Coccothraustes coccothraustes*).—Active-anting reported by Poulsen (1956b) from two captive birds.

\*CHAFFINCH (*Fringilla coelebs*).—Active-anting recorded in the wild (Longhurst, 1949; Goodwin, 1955b) and in captivity (Poulsen, 1956b).

BRAMBLING (*F. montifringilla*).—Active-anting observed by Poulsen (1956b) from two captive individuals. Ivor's (1941) Brambling was not seen to "ant".

(N.B.—No members of the other finch genera represented on the British List (*Chloris*, *Carduelis*, *Serinus*, *Pyrrhula*, *Carpodacus*, *Pinicola*, *Loxia*) have been recorded anting, and Poulsen (1956b) mentions that his captive Greenfinches (*Chloris chloris*), Linnets (*Carduelis cannabina*) and Canaries (*Serinus canarius*) did not perform although given the opportunity. No typical buntings (*Emberiza*, *Calcarius*, *Plectrophenax*) are known to "ant" either, though several other Emberizinae do so.)

### Family PLOCEIDAE

*Anting recorded from eleven species of which one is British.*

\*HOUSE SPARROW (*Passer domesticus*).—There is only one record of anting in this widespread species—of active-anting from a wild bird (Common, 1956). The note by Davis (1945) obviously refers to dust-bathing, not anting. More records are urgently needed; Poulsen's (1956b) Grey-headed Sparrow (*P. griseus*) did not "ant" although given the opportunity. The House Sparrow has one of the widest ranges of comfort-cum-cleaning behaviour of any species: it apparently "ants" occasionally, dust- and water-bathes, and also sun-bathes.

### Family MOTACILLIDAE

*Only one species known to perform anting and that is on the British List.*

TREE PIPIT (*Anthus trivialis*).—Active-anting observed in a captive bird by Poulsen (1956b).

### Family TURDIDAE

*Anting recorded from eleven species of which six are on the British List.*

MISTLE THRUSH (*Turdus viscivorus*).—Only active-anting recorded so far; from wild birds (Abma, 1951).

\*SONG THRUSH (*T. philomelos*).—Both forms of anting observed in the wild (Stresemann *et al.*, 1935; Chisholm, 1944; Gough, 1947; Wells, 1951; Fitter and Richardson, 1951); and passive in captivity (Poulsen, 1956b).

REDWING (*T. musicus*).—Both active and passive-anting recorded by Troschütz (1931) and Poulsen (1956b) in captivity.

RING OUZEL (*T. torquatus*).—Active-anting mentioned in Wackernagel (1951).

\*BLACKBIRD (*T. merula*).—Only active-anting so far reported from this apparently infrequent "anter" (Williams, 1947; Logan Home, 1954; Tenison, 1954; D. W. Snow, pers. comm.; Simmons, pers. obs.). Ivor's (1943) Blackbird was not seen to "ant", and all the other records are of wild birds.

AMERICAN ROBIN (*T. migratorius*).—"Ants" both actively and passively (Nichols, 1943; Ivor, 1956; Poulsen, 1956b). Ivor's birds were never observed performing passive-anting completely, though one spread its wings as if to do so on one occasion (see Fig. 6).

(N.B.—The distribution of anting in the thrush family is rather peculiar. So far the behaviour has been noted mainly in the large birds of the genera *Turdus* and *Hylocichla*; and apart from that, only in the Magpie-Robin (*Copsychus saularis*) and the Shama (*Kittacincla malabarica*), two medium-sized species. No wheatears and chats (*Oenanthe*, *Saxicola*, etc.), redstarts (*Phoenicurus*), nightingales and bluethroats (*Luscinia* and *Cyanosylvia*), or the Robin (*Erithacus rubecula*) and allied species have been seen performing. Poulsen (1956b) gave two Redstarts (*Ph. phoenicurus*), a Nightingale (*L. luscinia*), two Robins, one Pied Bush Chat (*Saxicola caprata*) and an Indian Robin (*Saxicoloides fulicata*) the opportunity, with negative results, though all ate the ants.)

### Family CINCLIDAE

*One record of anting only, from a species on the British List.*

DIPPER (*Cinclus cinclus*).—Active-anting recorded by Heinroth (1911) and Braun (1924) from captive birds.

### ANTING IN OTHER EUROPEAN PASSERINES

Only one more native European bird is known to "ant", the

Azure-winged Magpie (see p. 408), but the following American vagrants do: the Catbird (*Dumetella carolinensis*, Family Mimidae); the Hermit Thrush (*Hylocichla guttata*), the Slate-coloured Junco (*Junco hyemalis*, Family Fringillidae); and the White-throated Sparrow (*Zonotrichia albicollis*, Family Fringillidae).

#### ANTING AS INSTINCTIVE BEHAVIOUR

It is evident from their stereotyped nature that anting-movements are innate, not acquired by learning. This is supported by observations on a few birds known to be anting for the first time and to have seen no others performing (see Nice, 1943; Goodwin, 1952; Poulsen, 1956b). Inexperienced birds "know" how to "ant", but seem to have to learn for certain that ants themselves are the correct objects to use, the taste of the insects probably being the major factor. Some observations (*e.g.* Condry, 1947) indicate, however, that there is at least a slight predisposition to recognize ants as the correct objects, but that this has to be reinforced by experience. On this basis, it is not hard to understand that quite a variety of other items, caustic in nature, are used on occasions by anting birds besides the conventional acid-carrying work-ant. Osmaston's (1909) hand-reared babblers used pungent-smelling bugs (*Rynchota* sp.; Hemiptera), and the literature is full of instances of strange substances being employed, "usually of an apparently irritant nature such as tobacco ash, lighted cigarettes, mothballs, small limes, and various insects" (Goodwin, 1955b). To this list, Nice (1955) adds hot chocolate and soap suds, but perhaps the most spectacular case\* concerned a tame Magpie which would collect a bill-full of ants, fly indoors, dip them into the bowl of a lighted pipe and rub the mixture under the wing (Chisholm, 1944). As early as 1911, Heinroth had recorded this species anting with cigar butts.

On occasions, experienced birds may show anticipatory anting-movements merely on seeing the insects. Also, they may use acid-less male "flying" ants and ant-species which do not produce any acid. Poulsen (1956a and b) sprayed captive birds with formic-acid (and also citric-acid and formalin) in order to induce them to "ant". If these liquids reached the birds' breasts or backs they merely shook their plumage and flew away; but when they were squirted on the head, they then performed intense anting-movements. A Jay, already anting when Poulsen sprayed it, "made incipient anting movements and sometimes complete anting" when he stood by its cage with the sprayer unused in his hand some hours later.

Partially on the evidence just mentioned, Poulsen is of the opinion that active-anting is performed "unintentionally", merely as a reaction to acid or other irritants on the head. However, most authorities on anting believe otherwise. Poulsen states in further support of his theory that there is no indication of the waxing and waning of an internal anting "drive". Birds studied

\*Since this was written, Burton (1957) has described (with photographs) how a Rook performed both kinds of anting in fire.



by him ate ants and also anted every day (sometimes several times daily) for more than a month. On the other hand, he did find evidence that passive-anting was internally motivated, the birds concerned anting only when they were in anting "mood". However, the work of Goodwin clearly indicates fluctuations in the tendency to perform both kinds of anting. Although ant-eating is common (at least in aviary birds), anting itself is more rarely shown. "Whereas captive insectivorous birds are nearly always eager for live insects . . . it may be weeks before they are eager to ant again after having indulged" (Goodwin, 1955b). Some species, or perhaps more accurately some individuals, "ant" extremely rarely. Thus, Ivor's (1956) Evening Grosbeaks (*Hesperiphona vespertina*) and Cedar Waxwings were only seen to "ant" once in nearly eighteen years of observation. Goodwin's (1955b) Lanceolated Jays (*Garrulus lanceolatus*) performed when first given ants in 1951 but not again subsequently, and his tame Magpie never anted during the three years he had it—yet individuals of both species in the London Zoo anted keenly on each occasion he gave them Wood Ants. Evidence of this sort does not support Poulsen's theory which implies that active-anting is really no more than a reflex, that is an automatic reaction to external stimuli, not influenced by central nervous processes. A bird anting intensely and protractedly, seeking the ants and selecting workers, using and then often rejecting them afterwards, certainly does not convey that its behaviour is only unintentional. Poulsen's theory also implies that the two forms of anting are unrelated, but this seems very doubtful as the two may often be performed together and intermediate behaviour occurs.

Anting-behaviour of both types does seem, rather, to be true instinctive-behaviour in the modern sense. The very fact that we can observe intensity variations, although the external factors are not altered appreciably, strongly suggests that all anting-behaviour is really instinctive, that is governed by both external and central-nervous factors. Poulsen's work clearly shows, though, that anting is one of those behaviour-patterns greatly influenced by external stimuli (bathing in water, preening and head-scratching are others)—but that is not the whole story, of course. Anting possesses all the variable characters of instinctive behaviour. For example, if the internal tendency to "ant" is strong, then the bird may do so with inadequate objects ("ant-substitutes", male ants, etc.) or start anting merely on seeing the workers ("anticipatory anting"—wrongly termed "vacuum-anting" by Simmons, 1955). Conversely, if strong external stimuli associated with anting are present, this may induce a bird to "ant" even though it were not previously in the mood. Poulsen's spraying experiments may be interpreted along these lines. Anting-behaviour does seem to be a more or less independent pattern with its own specific motivation, perhaps belonging to the same group of behaviour-patterns as preening and bathing (see below). That

it is often associated with feeding does not necessarily mean that this connection is a fundamental one. Anting and feeding share a common causal factor in this case—ants. Frequently the two tendencies do not inhibit each other and a bird can “ant” and eat the insects during one session. Often the tendency to feed is stronger than that to “ant” because, in addition to the worker-ants, the more edible larvae are present, especially under aviary conditions (see also pp. 403-404). However, all the evidence suggests that, when the urge to “ant” is very much stronger than that to feed, then anting will predominate, the birds often discarding the ants without eating them.

#### THE ORIGINS OF ANTING-MOVEMENTS

Active-anting has all the characteristics of “derived activity”, that is of a behaviour-pattern adapted and modified from existing ones by natural selection in order to serve a new purpose. Most derived behaviour has a signal (display) function (see Tinbergen, 1952), but active-anting is one of the relatively few conspicuous exceptions, the dust-bathing of the House Sparrow being another (Simmons, 1954). Like Poulsen (1956b), I cannot agree with Chisholm (1944) that this form of anting may have originated from birds’ dust-bathing in the loose earth on the surface of ant-colonies, for a comparison of the respective movements does not confirm this. The dusting behaviour of the sparrow contains elements similar to bathing in water and to nest-shaping, while anting is most like preening.

The more extensive anting of some crows and, especially, of the Purple Grackle supports the possibility of a link between anting and preening. The grackle actually “digs” the ants into its contour-feathers with motions very similar to preening. The anting-like behaviour of certain non-Passerine Australasian lorikeets (*Trichoglossus* spp.) is also suggestive. These parrots chew Eucalyptus shoots and get the volatile oil on their bills. They then obtain further oil from the preen-gland and preen the tail, breast, belly, under-wing, back, mantle, wing-coverts and flight-feathers—always in that order (Harwood, 1955).

The typical, more restricted movements of active-anting are in several ways similar to normal preening (especially to the rapid preening before and after water-bathing) and very probably derive from this (Simmons, 1955; Poulsen, 1956b). There are elements common to both anting and preening, including the raised posture of the wing, the spreading and sideways movement of the tail and the method of dealing with the feathers from base to tip. The differences seem in part due to the entirely separate situation in which each is performed. When anting, the bird does not seize hold of its feathers in the bill, and a new factor—the ant—is present. Otherwise anting differs from preening mainly in that its movements are more extreme and are co-ordinated differently, both common characters of derived behaviour. In preening, the

wing and tail are never brought forward together or so completely as in anting. Poulsen (1956b) points out that an anting bird, supposedly never like a preening one, sometimes rubs its head amongst the wing-feathers. However, a similar movement occurs when a bird applies preen-oil, a not insignificant parallel. Precisely in what manner active-anting has arisen from preening is not yet clear, but there is no reason to suppose that it was originally a displacement-activity.

It seems strange that most birds "ant" only on the underside of the outer primaries and rectrices. As pointed out by Brackbill (1948) and others, these feathers are the stiffest parts of the entire plumage. Their rigidity is increased further by the anting-posture itself, in which the wing often touches the ground while the tail lies along it. These are, therefore, the ideal areas on which to rub ants in order to extract acid efficiently and rapidly. Being most remote from the tracts of skin, they are also the safest areas and their use, then, may have evolved because rubbing the insects on other parts was mainly ineffective and/or unpleasant, or even dangerous. Possibly today's active-anting movements are mere relicts of a once more widespread anointing which proved harmful in some way and was reduced by natural selection. Now, only the larger species can practice a more elaborate anting. Some foreign species show a precaution bordering on fear when anting even with relatively harmless ants; this suggests that they might use, or at least on occasions be likely to encounter, ants that are potentially dangerous. Observations on tropical driver-ants (for example Elliott, 1950) are of great interest in this connection. Birds follow the foraging swarms and prey on the insects disturbed by the lethal soldier-ants, showing much fear of the latter. Should an attending bird get among the ants, then it may be swiftly killed. The largest species of British ant is the Wood Ant which may conceivably be capable of hurting smaller birds if applied unreservedly. Perhaps, also, larger and more deadly ants were present in the past when anting first evolved. It seems possible, too, that anting first appeared in tropical or semi-tropical representatives of our Passerines for, today, anting is more widespread in bird species of the warmer regions.

Unlike the active-, the distinct passive-anting movements are not apparently derived from other behaviour, though Rothschild and Clay (1952) are of the opinion that these might have evolved from sun-bathing. There are, in fact, certain resemblances between the "spread-eagle" versions of the two, but this seems to be due to convergence. Both postures function to expose the maximum area of the bird to the desired object—ants and sun-rays respectively. Although less elaborate than the active, passive-anting seems in some ways more efficient in that it does expose a greater area of feathering to the formic-acid (and other exudations). If the theory that anting is (or was) potentially dangerous be correct, then the facts that only larger Passerines perform the



passive kind, and also alone use bill-fulls of insects, make considerable sense.

#### THE FUNCTION OF ANTING

The biological significance of anting is a most controversial topic; it is still largely uncertain why birds perform "this most improbable" behaviour, as van Tyne (1943) calls it. The current theories have been reviewed in detail by Wackernagel (1951) and by van IJzendoorn (1952) but, as Poulsen (1956b) points out, none are really quite convincing. Several, indeed, are quite unsound and will not be discussed (for instance, it has even been suggested that birds place ants in their plumage as food-reserves for long journeys).

The most popular theory is that anting is of some use in "the destruction or discouragement of ecto-parasites" (Goodwin, 1955b), though there is still no positive evidence for or against. Ivor (1956) has pointed out that if this insecticide theory is correct, then it is strange that the anting bird does not "rub deep under its wings and other parts of its body where parasites are most likely to gather" and this criticism has been repeated by Poulsen (1956b). However, the grackle and some crows do practice a more extensive anting, while passive-anting gives the insects access to all parts of the plumage. The restricted nature of most active-anting may be accounted for along the lines put forward in the last section and, in any case, as Goodwin has stressed, the formic acid may assist in combating the parasites during "the bathing and vigorous preening which usually follow anting". Ali (1936) elaborated the ecto-parasite theory and suggested that the consumption of the crushed worker-ants and their acid might be of use against endo-parasites. However, such a function could be achieved merely by the eating of ants.

Chisholm (1944) and Wackernagel (1951) think that birds "ant" in order to provide the skin with a tonic stimulant, while van IJzendoorn (1952) subscribes to the theory that they derive pleasure and exhilaration from the experience, similar to that which man gets from alcohol. Both these functions are not improbable, yet surely must be subsidiary? It is difficult to believe that natural selection could have produced such an unlikely and potentially dangerous pattern, which increases the birds' conspicuousness to predators and exposes them in certain cases to harmful insects, unless there was some more important function.

If Poulsen's theory of the reflex nature of anting should prove correct, the puzzle of the biological significance of anting is greatly simplified. Active-anting, then, simply functions in allowing the bird to avoid the discomfort of irritation on the head. When Poulsen first advanced this idea at the XIth International Ornithological Congress at Basle in 1954 it was enthusiastically received by Huxley (1954) and others. It has, however, been criticized by Goodwin (1955a and b), Simmons (1955) and by

Ivor (1956), while further arguments against are given and implied here. Long before Poulsen's work was done, Adlersparre (1936) and Steiniger (1937) had suggested that birds "ant" merely to clean the food of acid before eating. This was also well received, by Stresemann (editorial comment to Adlersparre's note), but subsequently criticized by Chisholm (1944). Such a theory again supposes that when a bird "ants" it is primarily motivated by a feeding tendency and this does not accord with the facts. Poulsen (1956b) has also put forward another suggestion—"It is of survival value at least for some insectivorous birds that they have a means, *viz.* anting, by which they are able to overcome the defence from their prey". However, birds usually incapacitate harmful insects in quite different ways: by banging them on a hard object, such as a branch, and/or by biting them quickly and then dropping them immediately, continuing this until the insect is dead. All the other facts about active-anting also speak against this view.

My own opinion, briefly mentioned elsewhere (Simmons, 1955), is that anting is of value in achieving a more efficient preening, including the removal of feather-parasites if present. This is supported by the probable connection between active-anting and true preening and by the fact that both forms of anting are often followed by bathing and preening, during which the acid could be distributed over many feathers. It seems very possible that formic acid may act in some ways similar to the bird's own preen-oil. This has been discussed by Brackbill (1948) who quotes an important and little known note by Kelso (1946). The latter suggested that oil was spread on the feathers for the purpose of irradiation, vitamin development and later ingestion through preening. Formic acid (and other exudations) might function, then, in a similar or even superior way when "affected by exposition to natural or artificial ultra-violet radiation".\* One of the primary functions of anting may be the disposal of stale oil from the plumage and the general improvement of the tone of the feathers.

#### FUTURE WORK ON PROBLEMS OF ANTING

Much yet needs to be discovered about anting, as often indicated in the body of this paper. Actual precise description is mainly the task of the aviary observer who is at a distinct advantage in this subject. He can make careful studies on individual species to show specific differences which have tended to be obscured in the general summing-up. He can also experiment. We need as many records as possible for additional species from all parts of the world. The value of anting from the point of view of the classification of the Passerines (and especially of the Fringillidae) needs to be examined and this can only be done if records—both positive and negative—are available for many

\*There is, so far as I know, no evidence of a link between the performance of anting and sun-bathing, as implied by Brackbill.

groups. A brief report on taxonomic aspects of anting has been prepared for publication elsewhere. The rôle of the field observer is an important one, too. One of the most valuable papers on anting, that of Brackbill (1948), was based on observations of wild birds. More records are needed of anting in the wild, especially on the circumstances in which birds "ant" naturally (a subject about which we know very little), the ant species used (an aspect not covered in this paper) and their activity, and so on. A particularly useful study would involve the watching of certain colonies of ants and recording all the reactions of birds to them, including avoidance and feeding, so that, among other aspects, some idea of the frequency of anting could be obtained.

It is not easy to observe wild birds anting under entirely natural conditions. I have seen the performance only twice in the field, from a Jay and a Rook\*, and my views were so fleeting that it would have been impossible for me to describe the behaviour from those observations alone. However, it is not necessary to wait for an opportunity to come; anyone keen to see an anting session can deposit a large heap of active Wood Ants (plus nest debris) in a suitable spot and is guaranteed an enjoyable and fascinating time, especially if any Starlings are in the neighbourhood. When publishing records, all important details should be given, such as whether ants were in fact seen in the bill, so that the validity of the observations can be judged by future workers. Care must be taken that it is indeed anting that is being observed. Some of the activities that could conceivably be mistaken for true anting include: (1) eating of ants, (2) dust-bathing, (3) preening, stretching and the scratching of the head, (4) sun-bathing, (5) shoulder-rubbing (see page 404), (6) picking ants off the body. If the present review has equipped observers to recognise and make worth-while studies on anting-behaviour, then one of its chief aims will have been achieved.

#### SUMMARY

This paper is a critical review, with bibliography, of the anting-behaviour of birds. True anting takes two main forms: active (the bird applies crushed ants to the underside of the wing and tail with its bill) and passive (the bird allows live ants to crawl on to its plumage). These, and intermediate behaviour and variations, are described in detail and seem confined to Passerine birds, well over one hundred species of which have now been recorded as anting. Of these, twenty are on the British List, of which only ten have been seen performing within the geographical boundaries of the British Isles. Woodpeckers and game-birds almost certainly do not "ant", as has been claimed.

Both forms of anting have many characters of true instinctive-behaviour and possibly function in effecting a more efficient preen-

\*And, since the above was written, from a Blackbird.



ing. In fact, active-anting probably derives from preening-movements.

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## THE STATUS OF THE PIED FLYCATCHER AND THE TREE PIPIT IN IRELAND

By P. W. P. BROWNE and ROBERT F. RUTTLEDGE

In *The Handbook*, the Pied Flycatcher (*Muscicapa hypoleuca*) and the Tree Pipit (*Anthus trivialis*) are described as vagrants to Ireland. This status is based, of course, on records made before about 1940.

Since the establishment of a Bird Observatory on the island of Great Saltee, Co. Wexford (south-east Ireland), in 1950, far more records of both species have been obtained there than existed





Bernard Corby

WOOD THRUSH (*Hylocichla ustulata*) ACTIVE-ANTING

Anting-behaviour is confined to the Passerines, of which the majority, including the present species, "ant" actively by rubbing ants along the underside of the wing and tail while assuming the special posture shown here (see pages 401-424). Unlike some *Turdus* thrushes, to which it is closely allied, the Wood Thrush does not, so far as we know, "ant" passively by lying down and allowing the insects to swarm over the plumage.





BLUE JAY (*Cyanocitta cristata*) ACTIVE-ANTING  
This species (here treating its left wing) frequently "ants" in the active manner. Note how the angle of the outer primaries has been changed to make the feathers more accessible.

Bernard Corby



Bernard Corby

BLUE JAY (*Cyanocitta cristata*) ACTIVE-ANTING

The Blue Jay often uses a single ant, but sometimes collects several. As is usual, the nictitating membrane is drawn over the eye to protect it. The anting of this species is not always quite typical for both wings are occasionally brought forward.





Bruce R. Young

AMERICAN ROBIN (*Turdus migratorius*) ACTIVE-ANTING

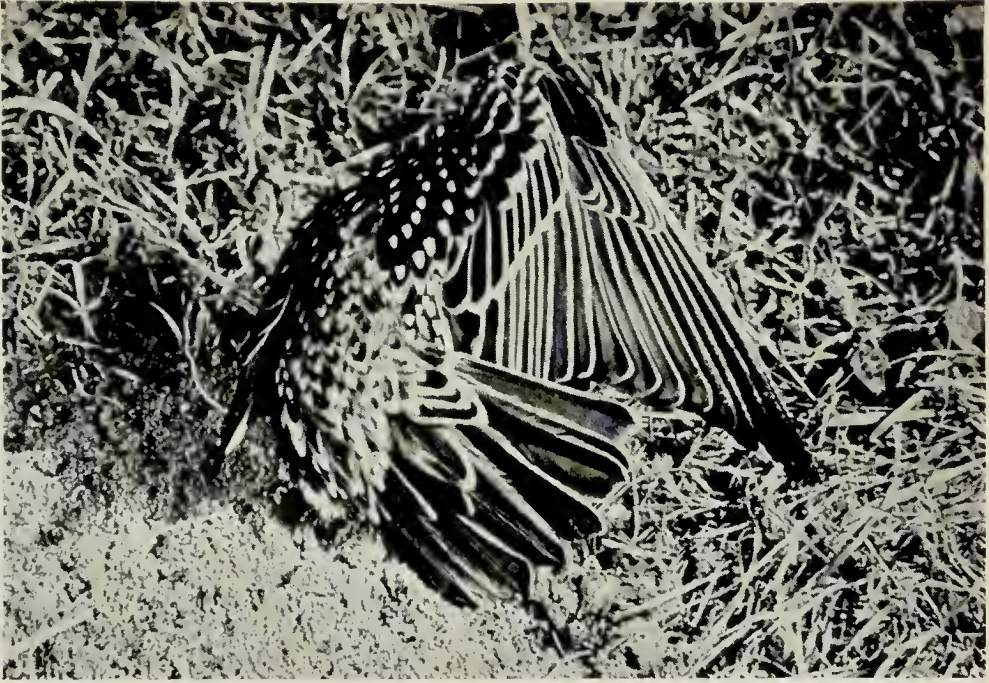


Bernard Corby

AMERICAN ROBIN (*Turdus migratorius*) ACTIVE-ANTING

The American Robin is one of the few species that "ant" by both the active and passive methods (see Figs. 6-8, pages 410-411). Here (*lower*) the bird is rubbing an ant on the underside of the tail which has been brought forward very sharply indeed. These and the other photographs by Messrs. Corby and Young were taken, with the aid of electronic flash, at H. R. Ivor's song-bird observatory in Canada.





Bruce R. Young

STARLING (*Sturnus vulgaris*) ACTIVE-ANTING

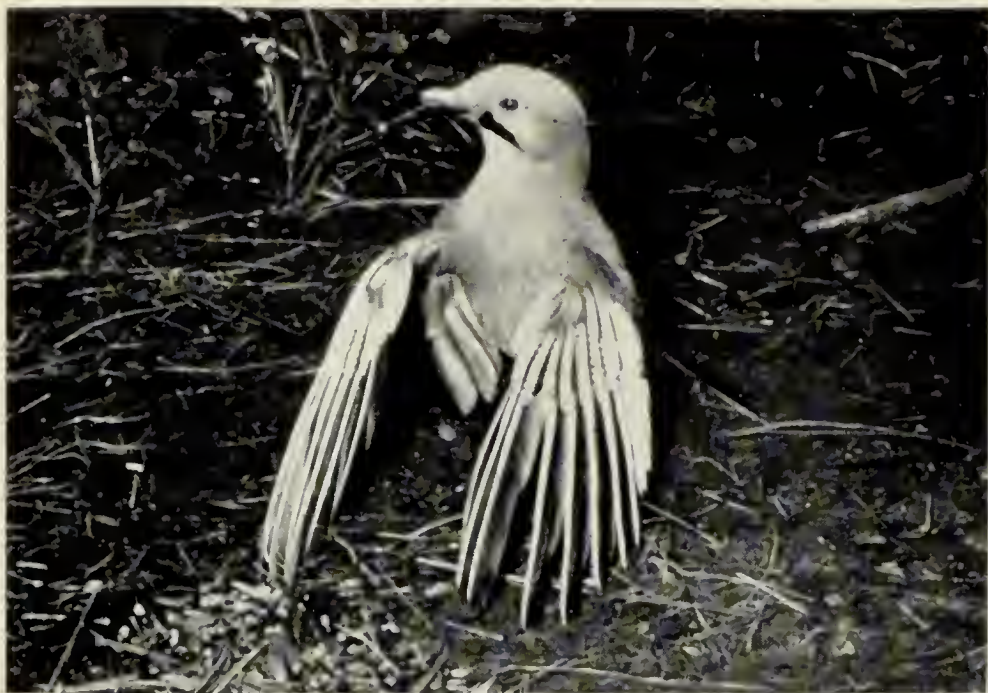


Bruce R. Young

STARLING (*Sturnus vulgaris*) ACTIVE-ANTING

This species is a very ready "anter". Unlike most species, it collects up a whole bill-full of insects to use (see Fig. 2, page 407). The upper plate shows an unusually full version of the posture employed to rub ants under the wing. These and the other photograph by Mr. Young are taken from beautiful colour-transparencies which have lost much of their clarity by being printed in black-and-white.





JAY (*Garrulus glandarius*) ANTING

Hans Lohrl



JAY (*Garrulus glandarius*) ANTING

Hans Lohrl

The anting-behaviour of the Jay combines elements of both active and passive forms. While this species does not pick up ants, it does go through the motions of rubbing them on the underside of the wings, both of which are spread forward to allow the insects to swarm up over the plumage. Although not shown above, the tail is often brought forward (see Fig. 3, page 408).





M. D. England

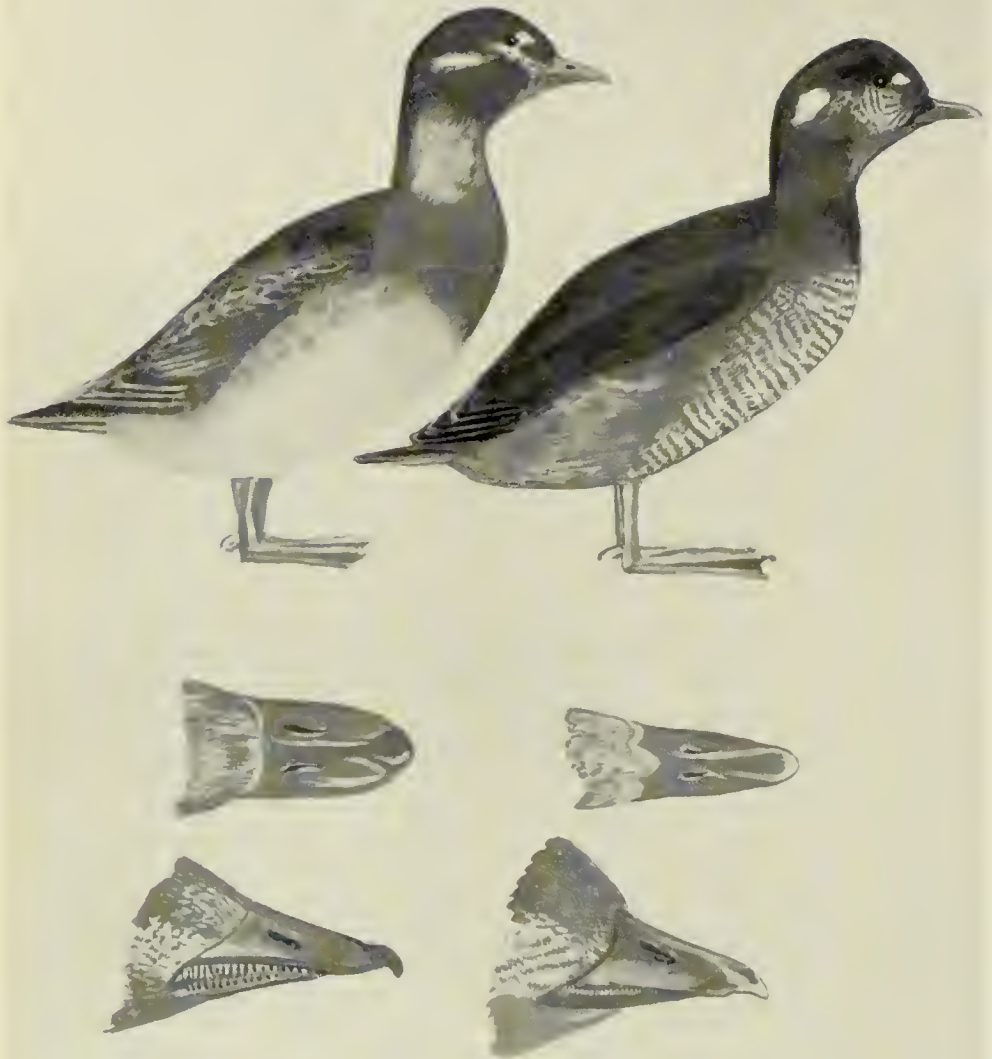
NESTING HABITAT OF BLACK-THROATED DIVER (*Gavia arctica*)



M. D. England

UNUSUAL NEST OF BLACK-THROATED DIVER (*Gavia arctica*)  
CENTRAL SWEDEN, 1955

The upper photograph shows the tiny island in the middle of a lake, where the nest illustrated below was found. This was a very large structure of reeds and grasses, built well clear of the water and deeply cupped (see page 439). "Built-up" nests of this kind are occasionally recorded in Scandinavia and may be less rare than previously thought. An almost equally large nest was found by the same island in 1954 (see *antea*, vol. xlviii, page 276, plate 40).



Drawn by F. C. Wynne-Edwards

JUVENILE PLUMAGES OF (left) LONG-TAILED DUCK (*Clangula hyemalis*)  
AND (right) HARLEQUIN DUCK (*Histrionicus histrionicus*)

There is an often unrecognized similarity between the head-patterns of the two juveniles (see pages 445-447), though the hinder patch on the Harlequin always appears cleaner white and more sharply marked, and the one below the eye rather larger. The best character is the white lower breast and belly of the Long-tail, compared with the Harlequin's ashy under-parts barred with dusky-brown. The top and side views of the respective bills, given below, illustrate the narrower, more tapering form of the Harlequin's.



previously for the whole of Ireland. It is our purpose, in this paper, to examine all available records made up to the end of 1955 and to assess, for each species,

- (i) the regularity of occurrence in Ireland,
- (ii) the relationship between wind conditions and recorded occurrences.

#### REGULARITY OF OCCURRENCE

The only substantial evidence on the regularity of either species in Ireland is that from Saltee Bird Observatory. Both species have been seen on the island nearly every year since the Observatory opened. However, in order to understand the implications of these records, the problem of detection must be dealt with. The Pied Flycatcher and the Tree Pipit differ greatly in the ease with which they can be located.

On Saltee, the Pied Flycatcher frequents the trees of a derelict garden (the only trees on the island). It is a noisy bird, conspicuous both in appearance and behaviour. Furthermore, over 50% of those recorded have been trapped and ringed. Consequently, it is unlikely that, as a species, it is seriously overlooked by observers staying on the island, even if they have no previous experience of this bird. For this reason it has been considered possible to apply statistical analysis to some of the records.

The case of the Tree Pipit is very different. Many of the records refer to birds seen in flight over the island. Other than four that have been trapped, all have been identified solely by call. Thus, only a person thoroughly familiar with the call and used to listening for it is likely to have any success in detecting Tree Pipits on the island. Since this species has been so rarely recorded elsewhere in Ireland, it is probable that few Irish ornithologists will have had the necessary experience to identify the bird and, in fact, it has transpired that all the records (call heard) on Saltee have been made by visitors from Britain. Browne has made about 85% of these. This has been due largely to his frequent visits to the island (totalling 19 weeks) over the years 1951 to 1955. He has a keen ear for the note, which he has known very well since before his first visit to Saltee. However, even then, he has found it necessary to spend long periods listening carefully (while walking, etc.), and has consciously adopted an attitude of expectancy of hearing the call; this has helped in the detection of faint, distant calls, which have then been followed up. During each autumn visit (1951, 1952, 1954, 1955), he has recorded at least two Tree Pipits on Saltee. The lack of records at the Observatory in the autumns of 1950 and 1953 must be considered with this in mind.

Bearing in mind the varying ease of detection of the two species and the experience of one observer with the Tree Pipit, it would



appear that both the Pied Flycatcher and the Tree Pipit are regular in the sense that each can be expected with some confidence on Saltee annually. The amount to which this expectation is to be tempered by wind conditions is dealt with in the next section.

#### INFLUENCE OF WIND

According to the theory of migrational drift, more occurrences of Pied Flycatchers and Tree Pipits in Ireland would be expected with some east wind over Britain than with only west winds. We have examined the *Daily Weather Reports* and, on this criterion, have classified days as either favourable or unfavourable to drift from Britain to Ireland.

##### *Pied Flycatcher.*

In the autumns of 1951-1955, between 20th August and 8th October (earliest and latest autumn dates on which Pied Flycatchers were recorded), Saltee was manned on 190 days. In Table I we show how many of these were favourable to drift. The 36 days on which Pied Flycatchers were seen, and also the 80 Pied Flycatcher bird-days, have also been classified as favourable or unfavourable. The proportion of days favourable to drift is higher in both cases than the proportion of days as a whole. From the chi-squared test, the probabilities of the figures arising by chance are respectively, about 1 in 10 and less than 1 in 100. So we can assert, with little fear of being wrong, the existence of a positive association between Pied Flycatcher occurrences and days favourable to drift, especially when more than one Pied Flycatcher occurs on the same day.

TABLE I—ASSOCIATION OF RECORDS OF PIED FLYCATCHER (*Muscicapa hypoleuca*) WITH WIND CONDITIONS, GREAT SALTEE, AUTUMN 1951-1955

	Favourable to drift	Unfavourable to drift	Total
Total days	75	115	190
Days Pied Flycatchers seen	20	16	36
Bird-days	55	25	80

Up to 1955 there were 137 Pied Flycatcher bird-days recorded for Ireland. Of these 81 are accounted for by five concentrations or rushes. The meteorological conditions just preceding and during these periods are set out in Table II. As can be seen, some of the rushes coincide with east winds, but other factors appear to operate too. Calm conditions on the night of 19th-20th September 1951, could not have caused drift, yet three Pied Flycatchers reached Saltee on 20th September. An increase of from one (on the 23rd) to five Pied Flycatchers occurred at Saltee on 24th September 1954, but winds were south-west at that time (see Fig. 3, and cf. Fig. 2). The implication of these facts is discussed in the section on re-determined migration.

TABLE II—METEOROLOGICAL CONDITIONS ASSOCIATED WITH RUSHES OF PIED FLYCATCHERS (*Muscicapa hypoleuca*) IN IRELAND

<i>Date of rush</i>	<i>Locality and strength</i>	<i>Weather synopsis</i>	<i>Wind</i>
23-25 Sept. 1949	Fastnet and Maidens Lighthouses 6+ bird-days	18-22 Sept. A/c N. of Britain 23 Sept. Depression S.W. of Ireland	E. over Britain Light variable over Ireland
20 Sept.- 8 Oct. 1951	Saltee 17 bird-days	19-20 Sept. A/c over Britain 21-23 Sept. A/c over Continent 1-8 Oct. A/c over Scandinavia	Calm in Irish Sea E. over Britain E. over Britain
17, 18, 23-26 Sept. 1953	Saltee 8 bird-days	12-17 Sept. A/c E. of Britain 18-22 Sept. Depression W. of Ireland 23-24 Sept. Col over Britain 25-26 Sept. Ridge over Britain	E. over Britain W. over Britain Light or calm Light or calm
23-27 Sept. 1954	Saltee 12 bird-days	21-23 Sept. A/c over Britain 24-25 Sept. Depression W. of Ireland	Light or calm; some E. 22-23 Sept. Strong S.W.
20 Aug.- 1 Sept. 1955	Saltee 38 bird-days	20-29 Aug. A/c N. of British Isles	E. over British Isles

Note—A/c = anticyclone

### *Tree Pipit.*

Because accurate observation of Tree Pipits has been so irregular, we have not tested the association between Tree Pipit records and wind conditions for the same lengthy period as for the Pied Flycatcher. Instead, we have limited ourselves to the 34 days from 11th August to 13th September 1952 inclusive—the longest period that Saltee has been manned continuously by observers who have proved themselves capable of detecting Tree Pipits there. On no day during this time was more than one Tree Pipit recorded. Table III shows the results. There is no indication of association between these isolated occurrences and winds favourable to drift.

TABLE III—ASSOCIATION OF RECORDS OF TREE PIPIT (*Anthus trivialis*) WITH WIND CONDITIONS, GREAT SALTEE, AUTUMN 1952

	Favourable to drift	Unfavourable to drift	Total
Total days	16	18	34
Days Tree Pipits seen	4	6	10

However, there have been three rushes of Tree Pipits in Ireland: at Tuskar Lighthouse, Co. Wexford, 3rd-5th September 1913 (7 bird-days); at Saltee, 20th-24th April 1954 (7 bird-days) and 24th-27th August 1955 (6 bird-days).

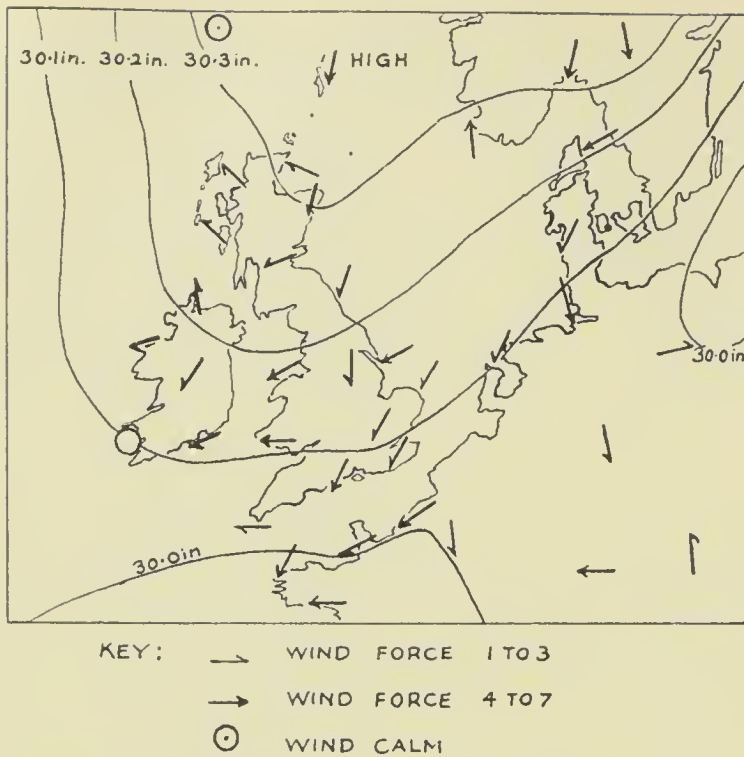


Fig. 1—0700 hours, 3rd September 1913 (G.M.T.)

This shows a typical weather situation coinciding with a rush of Tree Pipits (*Anthus trivialis*) in Ireland.

The meteorological records show that each was in very similar weather conditions. An anticyclone was centred north of the British Isles, and east winds prevailed over Britain. Thus, conditions for drift to Ireland were favourable. Fig. 1, copied from an early *Daily Weather Report* (3rd September 1913), illustrates this situation.

#### THE EVIDENCE FOR RE-DETERMINED MIGRATION THROUGH IRELAND IN AUTUMN

In the preceding part of the paper, it has been shown that both Pied Flycatchers and Tree Pipits have been recorded on Saltee on days in autumn when there was no likelihood of drift from Great Britain. However, it is possible that these birds had been drifted to Ireland previously and occurred at Saltee on re-determined migration. The possibility of re-determined migration can never be excluded, for days favourable to drift have been found to occur abundantly in the course of autumn periods examined (about 40% of all days). The greatest interval elapsing between successive days judged favourable to drift was 14 (9th to 23rd September 1954). No Pied Flycatcher has been recorded on Saltee more than 8 days after a day favourable to drift, no Tree Pipit more than 5 days.



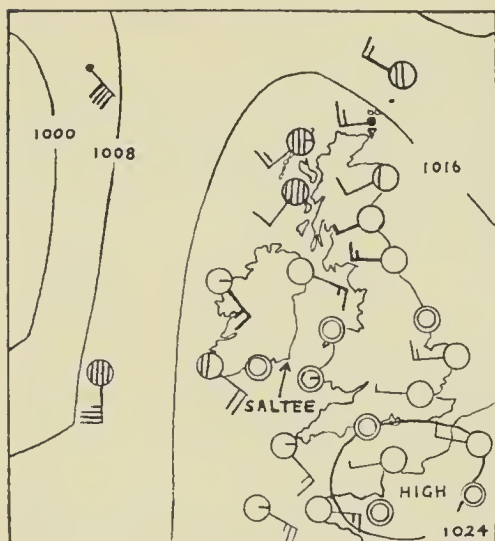


Fig. 2  
midnight, 22nd/23rd  
September 1954 (G.M.T.)

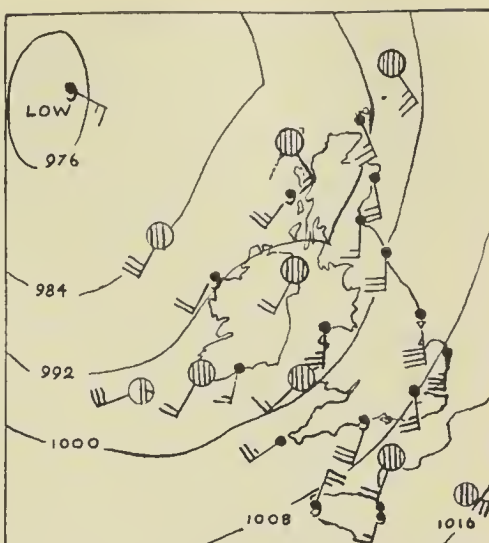


Fig. 3  
midnight, 23rd/24th  
September 1954 (G.M.T.)

Fig. 2 shows how good migration conditions coincided with the first day of a movement of Pied Flycatchers (*Muscicapa hypoleuca*) at Great Saltee on 23rd September 1954. There was a further increase on the following day, but, as Fig. 3 shows, the weather was by then unsuitable for movement from Great Britain and this increase was probably due to re-determined passage through Ireland.

The most notable case of probable re-determined passage was the peak of the Pied Flycatcher movement in September 1954 which came on the 24th, just one day after an isolated period of a few hours during which drift could have occurred (see Figs. 2 and 3). It seems certain that these birds must have come to Saltee from the Irish mainland. The rush at Fastnet, Co. Cork, on 23rd September 1949 seems to have had a similar cause, with wind drift to Ireland during 18th-22nd September and onward passage in light winds on the following days. Most other concentrations were recorded during prolonged periods of easterly winds, but two not obviously connected with drift were on 20th September 1951 and 23rd-26th September 1953. During both, however, winds were light or calm over parts of west Britain and the Irish Sea. In the first case, there is no evidence as to whether or not migration of the species to Ireland occurred previously during the same autumn, as the Observatory was not manned till 18th September. But in 1953 the meteorological conditions already outlined suggest that re-determined passage may have taken place. A few days before 23rd September, a period of easterly winds (12th to 17th September) brought at least two Pied Flycatchers to Saltee. Thereafter, till 23rd September, weather was unsuitable for migration and no Pied Flycatchers were seen. The much calmer conditions of 23rd to 26th September may have encouraged Pied Fly-

catchers already in Ireland, as a result of having been drifted there between 12th and 17th September, to move south.

Some isolated occurrences of Tree Pipits are also suggestive of re-determined migration. In 1954, in particular, all four records coincide with reductions in wind strength in southern Ireland, though only one (22nd August) was on a day favourable to direct drift from Britain to Saltee.

#### DISCUSSION

From the facts that have been presented, the following conclusions can be drawn:—

- (1) On a small island off the coast of Co. Wexford, both the Pied Flycatcher and the Tree Pipit are almost certainly regular visitors in autumn.
- (2) The greatest numbers of both species occur when anti-cyclonic conditions cause east winds over Great Britain.
- (3) However, there are numerous records at other times, and the evidence suggests that some arrive on the island while moving south, after having been drifted to the Irish mainland a few days previously.

These results are primarily of interest only in so far as they allow deductions about the status of these species in the rest of Ireland. To what extent is Saltee a good sampling point for Ireland? No direct work has been done elsewhere on this problem. However, there are facts which indicate that the island is probably a fairly good sampling point, at least for the south-eastern part of the country. The locality in Ireland which, after Saltee, has produced the greatest number of records of Tree Pipits and the second greatest of Pied Flycatchers is Tuskar Rock, which is 18 miles E.N.E. of the island. The visits of Prof. C. J. Patten in 1911 and 1912 were responsible for the first Irish records of the Tree Pipit (September 1912), and presumably inspired the collection of specimens by the Light Keeper in 1913. It should be pointed out, also, that two August records of Tree Pipits have been made at Kilmore Quay, on the mainland directly opposite Saltee, in the last few years. It has long been the opinion of Ruttledge that the occurrences of both species on the Irish coast have been grossly overlooked, and an attempt to prove this was at once a priority task on the establishment of the Saltee Bird Observatory.

The geographical situation of the island indicates that it must share movements with the mainland. It is located 11 miles W.S.W. of the south-east corner of Ireland (Carnsore Point), so that birds flying either north or south over Saltee may either reach the mainland or have just left it. In spring, in any case, there is no obvious reason why Saltee should be specially favoured compared with other points on the south coast of Ireland. This was shown in April 1954, when Hoopoes (*Upupa epops*) were recorded at many places on the coasts of Cos. Wexford, Waterford and Cork at the same time as at Saltee (Ruttledge, 1955). The

Pied Flycatcher and the Tree Pipit are, of course, much less conspicuous than the Hoopoe. It is also relevant to point out, as was noted in *The Birds of Ireland* (1954), that Co. Cork has produced more records of Pied Flycatchers at Light Stations than has any other Irish county (Co. Cork 14, Co. Wexford 10). This appears to indicate that the migration of this species is not specially concentrated on the eastern side of the country, and so the conclusions reached about south-east Ireland may be more generally applicable.

The data on re-determined migration are, of course, further indirect evidence that some individuals of both species arrive on Saltee in autumn after having spent a little time in Ireland. If this is so, it seems that drift from Britain accounts for the great majority of the records, but there can never be final proof that no Pied Flycatcher or Tree Pipit flies to Ireland without drift. At best, we can say that drift is a very important factor.

However, the known facts about the movements of these birds in western Europe indicate that their occurrence in Ireland in the course of normal undrifted migration should not be unexpected. Both species breed within a short distance of the west coast of Great Britain. Spaapen (1953) has shown that the general direction of migration of the Tree Pipit in autumn is south-west. This conclusion is based on ringing recoveries. Similarly, nearly all autumn recoveries of Pied Flycatchers ringed in Britain have been in west Spain and Portugal, giving a migration direction somewhat west of south. The dates of Irish records are also what one would expect for normal migration, according to *The Handbook* and to Spaapen (*loc. cit.*). Most of the Pied Flycatcher spring records occur in May, whereas those of the Tree Pipit are mainly in April. In the autumn, largest numbers of both species have occurred from about 20th August to the first week in October. It is noticeable, however, that, on the whole, there has been little concurrence of records of the two species on Saltee, even in autumn. This may be due to the fact that the Pied Flycatcher is principally a nocturnal migrant, whereas the Tree Pipit usually flies by day.

Thus, taking into account all the evidence that has been presented, we feel justified in summarising the status of each of these species in Ireland as "scarce passage migrant most often recorded in the south-east, regular in autumn, irregular in spring, occurring in largest numbers during and after periods of easterly winds".

#### SUMMARY

1. Both the Pied Flycatcher and the Tree Pipit were formerly regarded as vagrants to Ireland.
2. Evidence, obtained since 1950, is given which suggests that both species are regular in autumn, and frequent but less regular in spring, on Great Saltee, Co. Wexford.
3. It is found that the greatest concentrations of these birds



occur under wind conditions conducive to drift from Great Britain to Ireland. Such conditions can be expected several times in each autumn.

4. A number of records, however, are not associated with drift. It appears that some of these are due to re-determined migration through Ireland.

5. From these points, and from the distribution of other Irish occurrences away from Saltee, it is argued that the two species are regular visitors to Ireland.

#### ACKNOWLEDGEMENTS

We would like to express grateful thanks to H.M. Meteorological Office for access to the *Daily Weather Reports* and to H.M. Stationery Office for permission to reproduce maps copied from meteorological charts. Dr. A. R. Thompson and Mr. I. J. Ferguson-Lees have kindly criticised the draft, and offered helpful suggestions.

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## SOCIAL FLYING OF RAVENS

By RAYMOND HEWSON

GATHERINGS of Ravens (*Corvus corax*) for feeding and roosting are not unusual in Britain (Campbell, 1956); Coombes (1948) has also described flocks of Ravens not apparently engaged in these activities. The purpose of this paper is to draw attention to gatherings of another kind which indulge in aerobatic or soaring flight, unconnected with feeding or roosting areas. Aerobatic flying is highly developed in the Raven which in normal flight will often roll over on its back or make a short corkscrew dive without altering direction. It will also do this when flying towards anyone approaching its nest and young.

The stimulus to social flying is probably the sight of another Raven or Ravens playing in an air current or soaring over a hill-top. It is the habit of Ravens to fly along the ridges of hills, where they command a very wide field of view, and the characteristic rise and fall of a Raven playing in an air current is conspicuous and could readily be seen by others on surrounding hills. Typically the gathering begins with a small number of Ravens around a hilltop, no more than fifty or a hundred feet up, which other Ravens join, the group as a whole gaining height

while circling and playing until it has risen a thousand feet or more. The gatherings in Cyprus described by Hurrell (1951), in Pembrokeshire by Lockley (1953), and most of those watched by myself in Orkney (Hewson, 1949) and in Switzerland, were of this type. From six or eight to as many as 60 or more Ravens may be involved, at any time of the year except perhaps June-September. The birds disperse when high up, usually splitting up into pairs or groups of pairs and going off directly in different directions. In one case Ravens watched playing over a low hill in Sutherland settled on the hilltop and dispersed from there. The type of flying indulged in depends on whether the gathering is in a thermal, when it is mostly soaring, or in an up-current caused by the wind striking an escarpment, when steep climbs and dives are more usual, at a lower height.

Most of the birds within the gathering play together in pairs or in threes and fours, flying in tight circles, probably so as not to leave the uprising air current (Forster, 1955), following each other in corkscrew dives or steep climbs as if to loop with the bird rolling over at the top. A manoeuvre resembling the "falling leaf" of aircraft aerobatics also occurs; it is difficult to see what the Raven actually does but it appears to spin first to one side then to the other. In nine out of eleven cases considered the gatherings took place in the afternoon; in the other two, both at Arosa, Switzerland, the days were hot and sunny and soaring flight, in thermals, occurred before noon. Hurrell (1951) suggested that the Ravens he watched in Cyprus were attracted to a thermal and gathered there when the upward air current would be at its strongest. The fact that other gatherings in the afternoon made use of air currents caused by wind striking a hill, or, in the Pembrokeshire gathering described by Lockley, formed when atmospheric conditions played no part in social flying, suggests that such gatherings may not occur until after a period of feeding in the early morning. There appears to be no record of an early morning display of social flying.

The significance of these gatherings of Ravens is obscure but in Sutherland in November 1949 I noticed that a single bird among 5-6 pairs performed more spectacular aerobatics than the others, rising higher and diving lower. Similarly in Switzerland in March 1952 it was noticed that, although most of the aerobatic and soaring flight was done in pairs, the intensity of the performance was increased when three birds took part and it was impossible to say whether the original pair, if there was one, was maintained. In some of the gatherings in Orkney pairs seemed to break up during flight, but the final dispersal was mainly of paired birds. On Cadair Berwyn, Merionethshire, in September 1954, three Ravens flew along close together, in single file, twisting and turning continually to a much greater extent than any pair of Ravens going about its normal business. As Ravens gather fairly regularly for social flying at fixed places repeated observations should show whether pair formation is involved.

Although social flying is not generally connected with a roosting place, in one instance in Arosa 10-15 pairs circled together in the evening near the roost. The display lasted only about fifteen minutes and birds coming into roost later did so directly. The roost was in forest among 40-50 foot spruce at about 5,500 feet and was used, in early March, by about a hundred Ravens, many of which arrived from lower down the valley to the north-east. They roosted in two main groups about 200 yards apart, mostly at a height of between 20 and 30 feet. About 30 birds roosted in an area of trees about 30 yards across, the main group in an area about 100 yards across. As the maximum number of Ravens seen together in the Arosa area was about 50 this roost presumably served a fairly wide stretch of the valley. Nesting had begun and a few miles from Arosa about ten pairs of Ravens were at nests, or carrying sticks to nests, on a small rock face not more than 150 yards across and about a hundred feet high. It appeared to be the only suitable nesting cliff in the area although many tree nesting sites would be available. It was not possible to say whether the Ravens which soared over Arosa during the day roosted with those coming in from lower down the valley. No social flying was seen near a small Raven roost in Easter Ross found in June 1951, but Hurrell (1956) records aerobatics near a roost in Devon.

#### SUMMARY

1. Besides flocking at roosts and feeding places Ravens gather for aerobatic and soaring flight, often at thermals or up-currents caused by wind.

2. The stimulus to such gathering is probably the sight of one or more Ravens making use of a thermal or up-current. Because of their habit of flying along the ridges of hills this would be seen by Ravens over a wide area.

3. Most of the Ravens are paired and within the gathering play in pairs or small groups. Starting low over a hilltop the gathering rises to a considerable height, from which it disperses. In one case the gathering dispersed after perching on a hilltop.

4. Gatherings of this sort occur throughout the year except possibly during the period June to September. They may have some influence on pair formation.

5. In one case social flying occurred near a roost, but this is unusual. A Raven roost in Switzerland is described.

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## OBITUARIES

ARTHUR BROOK (1886-1957)

ARTHUR BROOK died on 15th March 1957, at Builth Wells Cottage Hospital, not far from where he was born on 11th April 1886. After leaving school, he served an apprenticeship in the watch-making industry and so acquired the skill which, added to his natural ingenuity, enabled him to adapt or make most of his own apparatus with which he photographed birds and mammals by day and by night for nearly fifty years.

Necessarily beginning a few years later than the pioneers, he took his first bird-photograph early in 1909 and between then and the 1914-18 war, in which he served in the Royal Flying Corps, he pictured many of the wild birds of central Wales. Within two years he had taken photographs of such species as Carrion Crow, Jackdaw, Jay, Heron, Kestrel and Sparrowhawk and in 1911 a selection of them appeared in the fifth of the *Wild Birds at Home* series published by Gowans & Gray, Ltd. In 1920 Witherby & Co. produced a small volume by him entitled *The Buzzard at Home*, illustrated by twelve of his photographs. After that war he turned his attention to flashlight photography of nocturnal birds and animals in their natural haunts by night, and his ingenuity and skill perfected synchronizers for shutters at a time when this type of photography, of which he was the pioneer in this country, was in its infancy.

In association with Captain H. A. Gilbert, during 1925-30, he photographed most British breeding birds in England and Scotland, as well as in Wales, and they also made expeditions to Hungary. They jointly produced several books describing their experiences and the birds they encountered, illustrated by Arthur Brook's photographs. He made a few contributions to *British Birds*, the first being an illustrated note on the Dipper in April 1912. More recently, in 1952, some of his pictures of Great White Heron, Glossy Ibis and Squacco Heron appeared in the series of "species rarely photographed" and, in 1953, some notable photographs of a Peregrine Falcon in flight, taken with a special shutter he had adapted to his own design.

He had the supreme ability of being able to capture the personality of a bird and his subjects really lived in his pictures. It is no exaggeration to say that he was the outstanding bird-photographer of his generation in this country.

It was characteristic of him that he was always trying to portray something fresh, some new feature not previously photographed, yet always with scrupulous regard for the welfare of his subjects, and his pictures of Buzzard, Sparrowhawk and Merlin flying in with prey to their young, taken in 1951-53, are striking examples; others being his unique photographs of Swifts flying in to and leaving their nests, taken in July-August 1956.

During the last war his skill was utilized in the instrument departments of a famous aeroplane works, the only time he left his beloved Welsh hills for a period of years; he was never happy away from them and over nearly five decades innumerable ornithologists and other naturalists were made welcome in his home and generously helped with advice and practical assistance. He had been a member of the Zoological Photographic Club for upwards of thirty years.

Although in his latter years his health was not good and he had to spend three periods in hospital, undergoing two major operations, his keenness never left him and he was still taking photographs, with all his old flair and skill, well into the latter half of 1956. Less than three months before he died he completed a series of new prints of some of his masterpieces for the historical section of the National Collection now being assembled by the Nature Conservancy. His negatives he bequeathed to the National Museum of Wales. H.M.S.

#### NORMAN BOYD KINNEAR (1882-1957)

THE SUDDEN DEATH of Sir Norman Kinnear, on 11th August 1957, his 75th birthday, is a great loss to the ornithological world and of particular sorrow to the countless ornithologists who have reason to be grateful for the help and advice he was always ready to give.

Sir Norman was not only an outstanding ornithological figure, but also one of the few remaining all-round naturalists, and his interest in other branches of the animal kingdom and in plants was second only to his own speciality. Born of Scottish parents, he was educated at the Edinburgh Academy and Glenalmond. He became a Volunteer Assistant at the Royal Scottish Museum in 1905 and his interest in that Museum was actively maintained until his death. In 1907 Norman Kinnear left Scotland for India where he occupied the post of Curator of the Bombay Natural History Museum until 1919 and during this time gained a wide knowledge of Asiatic birds. His connection with the British Museum (Natural History) began in 1920 when he was appointed an Assistant in the Zoology Department and during the years advanced to Keeper of Zoology. Finally in 1947 he was appointed Director of the Museum, being the first ornithologist to occupy this post, which he held until 1950.

He always played an active part in the affairs of the British Ornithologists' Union and was its President during the difficult period of 1943-48. Though in his official life a museum man, Sir Norman gave every encouragement to field work and for many years served on the Council of the British Trust for Ornithology and towards the end of his last term of office was elected Chairman when he did great service to the Trust by his diplomatic guidance of its affairs.

The width of Sir Norman's interests was so great, and the organisations to which he gave unstinted help so many, that it is difficult in a short space to mention them in any detail. He was a great supporter of the Linnean Society of London and he served on the Council of the Zoological Society of London, of which he became a Vice-President. He was a member of several Committees of the National Trust acting in various capacities from 1935 till the time of his death. One of the earliest members of the Society for the Promotion of Nature Reserves, he was elected a Vice-President in 1947. He took part in the work of the Nature Reserves Investigation Committees organised by the S.P.N.R., which provided the foundations on which the Nature Conservancy was built. He subsequently became a member of the Nature Conservancy on its establishment in 1949 and remained for his full term of office till 1955. During this time he also served on the Scientific Policy Committee, England and Wales Committee, Post-Graduate Research Studentship Sub-Committee and, from time to time, on the Grants Committee of that body. He also represented the Conservancy on the Government Working Party on precautionary measures against toxic chemicals used in Agriculture, which produced the report on risks to wild life, published in 1955.

Though intolerant of sentimental bird protection, Sir Norman's support of practical measures dates back to the Plumage Act of 1921. He served on the Home Office Advisory Committee which drew up the original proposals for the 1954 Bird Protection Act. As Chairman of the British Section, International Committee for Bird Preservation, from 1947 to the time of his death, Sir Norman achieved much in the field of international bird protection. His sound knowledge, patience and, above all, unfailing wisdom, played no small part in solving many difficult problems.

Of a very retiring nature, he abhorred publicity and even shunned acknowledgement; he always preferred to work quietly in the background and a wonderful grin would spread over his face when his efforts were crowned with success.

He leaves a widow and two daughters.

P.B.-S.

#### AVERIL MORLEY (1913-1957)

AVERIL MORLEY (Mrs. Frank Darling) died on 16th February 1957, at the age of 43. She was Secretary of the Edward Grey Institute of Field Ornithology at Oxford from 1938 to the end of 1942, during which time she completed a card catalogue of all books and pamphlets in the Alexander Library. From October 1955 until her death she had served on the Scientific Advisory Committee of the British Trust for Ornithology, the only woman who has yet done so. She was interested in birds from childhood, and her first publication, *Bird Life on Clifton Downs* (1931), was written when she was 18 years old. In this pamphlet she not only



lists the birds she had seen on the downs, but describes the different habitats there, and notes the differences of populations at different seasons. There are some characteristic touches already here: she comments on the Rook's "horrible, high breeding squeal"; she sees Starlings breaking the ice on puddles with their wings; and she refers to "willy wagtail" in defiance of "those grave and sedate persons who despise the nursery name".

Later, she took part with H. N. Southern in studying Marsh Tits in Bagley Wood (where the writer first met her one day in the summer of 1938), and in a series of papers written either in collaboration with Mr. Southern or alone she provided a detailed and vivid account of this delightful little bird (*British Birds*, vol. xxxv, pp. 261-266; vol. xlii, pp. 233-239; vol. xliii, pp. 34-47, 387-393; vol. xlvi, pp. 234-238, 273-287, 332-346). It is by no means an easy species to study, but by her patient, quiet withdrawal of herself, Averil was able to enter, as she wished to do, to some extent into the birds' world; and for all her cool, factual account of her observations, she allows the reader to see something of her own enjoyment. This she expressed more easily in verse, and one of the best of her poems, in her book *The House in the Forest* (1946) is "The Marsh Tit in Bagley Wood". There she might admit, what would be out of place in *British Birds*, that

"I his language a little comprehend,  
For he has made me what I am, without him  
I would not be I, but a stranger".

She spent some years of her life in the Western Highlands, but she much preferred Berkshire and the neighbourhood of Oxford, and confessed in one paper (*British Birds*, vol. xxxiii, p. 43) that she found "crowing cocks and bleating sheep more conducive to restless nights than sounds of traffic". She grew tired (she once said) of "so many Mountains and Methodists", and had no love either for the traditional sports of the English countryside. This admitted preference for the suburbs, or the country just beyond, appears in her writings on birds. Apart from her Marsh Tit studies, she made a number of observations on the behaviour of birds in winter—of Starlings, Blackbirds, Hedgesparrows, and Moorhens, birds that anyone may see in their gardens or in town parks. (Her two papers on the Black-tailed Godwit were compilations from local reports and similar sources.) Her years in the mountains produced no papers. But if she wrote for the most part of common, almost ubiquitous birds, she wrote of what she saw with a sensitive insight into their ways which, for her, needed supplementing, not with tables and statistics, but with poems.

She was gentle and retiring but quite firm, and she met her last illness calmly and without self-pity; with regret only that her three small children must so soon be left without her. Those who knew her will remember her elegance and good taste, her quiet voice and her still fresh and youthful colouring; and they will remember her always with affection.

E.J.M.B.

## NOTES

**A second unusual nest of Black-throated Diver.**—In June 1954 I found an unusual "built-up" nest of the Black-throated Diver (*Gavia arctica*) and details were published in *British Birds* in 1955 (*antea*, vol. xlviii, p. 276, plate 40). The lake concerned, in central Sweden, was visited again in June 1955 and a pair of Black-throated Divers had again nested on the tiny island (plate 63 upper), within six feet of the nest of the previous year. It is perhaps reasonable to assume that at least one of the pair was the same as had been responsible for the curious nest of 1954, since in some ways this new nest was even more unusual (see plate 63 lower). It was built, as before, of reeds and grasses, but instead of being more or less in the water was high above it on the completely dry part of the island. In addition it was quite deeply cupped, and the bird must have had considerable difficulty in climbing into it.

The farmer who lent us the boat to reach the island did not seem particularly surprised at the nest, which we understood him to say he associated with sharp changes in the water-level. In neither year, however, when we saw these nests, was there any sign of a rise in the water-level; on the contrary, the weather was sunny with high winds.

M. D. ENGLAND

**Feeding association between Bewick's Swan and Mallard.**—In recent notes (*antea*, vol. xlix, p. 501; vol. l, pp. 351-352) feeding associations between two and three species of water-birds have been described. In the one case Coots (*Fulica atra*) and Little Grebes (*Podiceps ruficollis*) were involved; in the other, in Australia, Coots, Dusky Moorhens (*Gallinula tenebrosa*) and Australian Little Grebes (*P. novae-hollandiae*). It may therefore be of interest to record another feeding association—this time between two Bewick's Swans (*Cygnus bewickii*) and a pair of Mallard (*Anas platyrhynchos*)—which I observed at Blagdon Reservoir, Somerset, on 15th January 1957.

The Mallard attracted attention because of their prolonged proximity to the Bewick's Swans which, standing in shallow water, were either stamping or scraping backward with their feet over the muddy surface of the reservoir bank. In this way they stirred up much aquatic matter and caused the surrounding water to become thick and cloudy; then, by dipping heads and necks below the surface, they fed in typical manner. Immediately following each "stirring-up" performance the Mallard, which were seldom more than a few feet away, began to "up-end" and feed, and as the swans gradually worked their way along the surrounding shallows so also were they quietly pursued in this way by their companions.

BERNARD KING

**Mediterranean Black-headed Gulls in Sussex.**—In 1956 and 1957 Mediterranean Black-headed Gulls (*Larus melanocephalus*) were seen with unprecedented frequency between Newhaven and Shoreham-by-Sea, Sussex. The following summary and other details have been collated from information recorded by a number of observers, whose names are listed at the end.

- 10.3.56—25.3.56: One adult, Brighton and Hove (C.F.B., B.J., C.M.J., B.A.E.M., G.A.S., J.S., J.M.T.).
- 2.4.56: One adult, Piddinghoe Pond (C.M.V.).
- 22.7.56: One adult, between Ovingdean Gap and Rottingdean (B.J., C.M.J.).
- 27.7.56: One adult, Ovingdean Gap (B.J., C.M.J.).
- 6.8.56: One adult, Saltdean (B.J., C.M.J.).
- 15.8.56—16.8.56: One adult, Brighton (G.A.S., M.H.P.).
- 19.2.57—22.2.57: One immature, Brighton (J.M.T., C.M.V.).
- 21.2.57—16.3.57: Two adults, Brighton and Hove (C.F.B., B.J., C.M.J., B.A.E.M., M.H.P., G.A.S., C.M.V., R.J.W.).
- 9.3.57: One immature, Newhaven (L.P.A.).
- 10.3.57—14.3.57: One adult, Shoreham-by-Sea (V.G., H.P.M., J.S.).
- 15.3.57: Two adults, Shoreham-by-Sea (J.S.).
- 1.8.57: One adult, Roedean (B.J., C.M.J.).
- 14.8.57: One adult, Ovingdean Gap (B.J., C.M.J.).

It appears that in the early part of 1956 a single adult was present in the area and it is probable that two adults visited the coast later in the year. In 1957 at least two adults and an immature were present.

The gull seen on 10th March 1956 was in almost complete summer plumage, as were the birds of 22nd July 1956, 21st February 1957 and 1st August 1957. The gulls of 27th July 1956 and 14th August 1957 were well advanced to winter plumage. From the descriptions recorded for the adults the following has been extracted:—Were somewhat larger than the Black-headed Gulls (*Larus ridibundus*) with which they often associated and were somewhat longer in the leg than these birds. The upper surface of the wings was given as very pale grey by the majority of the observers, but the primaries although recorded as "white" were darker than the white of the breast. So far as is known, all observers failed to find any darker markings in the outer webs of the outer primaries (cf. *antea*, p. 202). The descriptions of the immatures were similar to those published on previous occasions (e.g., *antea*, vol. xlv, p. 321).

On 8th March 1957, one of the adults was resting in a group of Black-headed Gulls. It opened its bill very wide several times so that the red-orange interior was visible, though no sound was heard. Some of the Black-headed Gulls then started displaying and the "Mediterranean" followed with a bowing motion with breast lowered and head and back nearly horizontal; the tail was raised at the same time. The bird then drooped its wings and raised its bill to an acute angle.

Several observers noted that the birds seen in the early months of the two years frequented localities where gulls were fed by



humans, and on one occasion one was seen to take bread. It may be worth mentioning that the Mediterranean Gulls at Piddingham and Shoreham-by-Sea were some distance from the sea and not in marine habitats. The bird of 22nd July 1956 carried a ring on the left leg.

We would like to thank the following for forwarding notes and replying to enquiries: L. P. Alder, C. F. Brown, Mrs. V. Gilham, Mrs. B. James, B. A. E. Marr, H. P. Medhurst, M. H. Port, G. A. Sutton, Dr. J. Stafford, J. M. Twort, R. J. Wilmshurst.

C. M. JAMES and C. M. VEYSEY

[As was pointed out on a previous occasion when a Mediterranean Black-headed Gull was seen to be carrying a ring (*antea*, vol. xlviii, pp. 330-331), large numbers of these birds have been marked on the island of Orlof, where the Dnieper runs into the Black Sea (see *Alauda*, vol. xxii, pp. 225-245). We still do not know of any other places where this species is ringed.—EDS.]

**Swallow's nest with eleven eggs.**—On 13th July 1956, I was asked by Mr. T. Newall if I could explain why the Swallows (*Hirundo rustica*) in his cow-shed at Pant, nr. Oswestry, Shropshire, should have "about a dozen eggs" and not hatch them. I went to the shed and he got a ladder for me to examine the nest which was against the end wall of the cow-house, right up at the apex of the roof. It held eleven eggs which I took down for more careful examination. Six were opaque, having evidently been incubated a long time, while five were fairly fresh. Both sets were obviously the produce of the same bird. All the eggs struck me as being below the average size and this was obvious when they were compared with an egg from another nest.

I took the six older eggs (though one got broken) and put the five fresher ones back in the nest. These were visited for me occasionally by Mr. Newall who reported that the bird continued to sit and was still doing so on 16th and 20th August. On 29th August, however, the pair were just visiting the nest. I got Mr. Newall to take the eggs for me at the end of the year, by which time the nest contained two whole eggs, one partly smashed and some bits of shell.

Mr. R. G. Strafford very kindly measured the five left of the first six: (1) 17.59 × (broken) mm.; (2) 17.52 × 13.79 mm.; (3) 17.99 × 13.72 mm.; (4) 18.39 × 13.96 mm.; (5) 18.63 × 13.98 mm. The average of the five lengths and the four breadths is 18.02 × 13.86 mm. *The Handbook* gives 19.98 × 13.74 mm. as the average of 100 eggs, so that these eggs were considerably shorter and a fraction wider than the normal. All had yolks.

J. H. OWEN

**Starlings alighting on ship from the United States.**—With reference to the note on a Starling (*Sturnus vulgaris*) crossing the

Atlantic on board a ship (*antea*, pp. 209-210), it may be of interest to record that on 26th March 1955, I was returning from the United States by sea, when two Starlings were sighted flying ahead of the ship, i.e. travelling due east. Our position at the time was approximately  $41^{\circ}50'N.$  and  $58^{\circ}40'W.$ ; this is very nearly 800 miles east of New York and about 250 miles south of the nearest land, which was Sable Island off the coast of Nova Scotia; the wind was moderate south-east and visibility good. The birds were certainly flying due east, on the same course as the ship, and we overtook them at  $31\frac{1}{2}$  knots. Their flight was weak and much more undulating than Starlings normally employ, which gave me the impression that the birds were rather obviously fatigued. When overtaken, they perched on the rigging and remained there for the rest of the day. Next morning they had disappeared.

GUY MOUNTFORT

**The behaviour of House Sparrows in the presence of ants.—**

On 30th July 1953, 2nd August 1954, and 21st, 22nd, 23rd, 24th and 27th July 1955, I observed House Sparrows (*Passer domesticus*) behaving strangely near some ant-holes at the foot of a stone pillar set in a cobbled yard at the British Railways goods depot at Old Ford, London.

On every occasion but one, the birds acted in the same manner. They would hop into the swarm of ants from the ground or fly down from the top of the pillar, which is about three feet high. After standing among the ants for a few seconds, they would leap away or fly up to the pillar. They would then apparently pick something from their plumage—that is, they would go through the motions of doing this and, as no bird was ever seen to pick anything up when it was on the ground, except on the occasion described below, they could not be interpreted as placing anything on their feathers. In every instance the area of plumage involved was the lower breast.

On 27th July 1955, however, House Sparrows were seen three times actually to place ants on their feathers. A male collected three ants in its bill and placed them on its breast. Then another male, or possibly the same one, was seen to pick something up from the top of the post and do the same. Later another bird took a worker and a winged ant to the top of the pillar and there attacked them furiously before similarly placing them on its breast. No rubbing movements were seen on any of these occasions.

Unfortunately the exact number of House Sparrows visiting the ant-holes was not noted, but it was certainly not more than fifteen birds at a time and generally only about ten or less; both sexes took part. On all occasions the incidents took place at about the same time, approximately 1800 hours B.S.T. T. SEABROOK

[Elsewhere in this issue (pp. 401-424) there appears a review, by Mr. K. E. L. Simmons, of the anting-behaviour of Passerine

birds. At our request Mr. Simmons has provided the following comment on the above note.—EDS.]

The behaviour described lies outside the considerable experience of Mr. D. Summers-Smith, who is making an intensive study of the House Sparrow, and also outside my own experience which is far more casual though I am always on the look-out for anting in this species. On the majority of occasions, the behaviour superficially resembles passive-anting in that the birds seemed deliberately to position themselves among the ants which, presumably though not certainly, crawled on to their plumage. On the other hand, the behaviour on the one date resembles active-anting in that the insects were picked up in the bill and, presumably, rubbed on the feathers. Yet, in no case were any of the characteristic postures and movements seen and, because of this, I think it would be premature to classify this behaviour as anting until more facts are available.

More observations on the reactions of sparrows towards ants are urgently needed, including negative reports. In my opinion, there are as yet no properly described records of anting in the present species. The case reported by M. Davis (*Auk*, vol. 62, p. 641) seems certainly to refer only to the familiar dust-bathing, while full details of posture and movements are missing from M. A. Common's note in *British Birds* (*antea*, vol. xlix, p. 155).

K. E. L. SIMMONS

## REVIEWS

TWENTIETH CENTURY BESTIARY. By various authors. (Bell, London, 1957; first published in U.S.A., 1955). 240 pages. 13s. 6d.

THIS COLLECTION of articles, originally published in the *Scientific American*, contains nine concerned primarily with birds. Written by professional biologists in "non-technical English prose", they provide a stimulating picture of some of the growing points of current ornithological research.

Two articles on behaviour—one on courtship by Dr. N. Tinbergen and the other on Swifts by Dr. D. Lack—will be of special interest to readers of *British Birds*. The former shows how patient observation can help to elucidate the apparently endless complexity of avian courtship: pair formation and courtship are shown to depend on a complex interaction between attack, escape and sexual attraction. Dr. Lack's chapter on Swifts is filled with details of behaviour and ecology, and amply demonstrates the importance of all-round life-history studies in which the interaction of the various aspects of the bird's life can be seen.

The relevance of an ecological approach for studies of evolution



is shown by the same author's article on Darwin's Finches—a group of small finch-like birds living on the Galapagos Islands, which had an important influence on Charles Darwin. The extensive speciation which has occurred amongst them illustrates that both hybridization and competition must be minimized if two closely related forms are to inhabit the same area. Professor E. S. Deevy's article on the "End of the Moas" also adopts an ecological approach to the study of evolution, considering a number of problems about the extinction of these curious creatures.

Physiology is represented by Dr. O. P. Pearson's article on the metabolism of hummingbirds. Laboratory experiments have shown that some hummingbirds have an extraordinarily high rate of metabolism, and that they survive the night by a sort of hibernation. Four articles are concerned with various aspects of bird flight—aerodynamics (Dr. J. H. Stonor), adaptations for flight (Dr. C. Welty), and two articles by Professor D. R. Griffin, one on navigation and the other on the use of "Sonar" by the cave-dwelling guácharo in Venezuela.

Apart from these articles specifically concerned with birds, there are 15 dealing with other groups. Many of these will also be of interest to the ornithologist—for instance Dr. Tinbergen's chapter on Stickleback behaviour, which reveals principles of widespread importance. Although the articles are short, each is full of information: the book as a whole illustrates the merits of a broad approach to ornithology, and will prove stimulating to many bird-watchers. Some of the chapters deal with the results of highly specialized research, but a knowledge of the principles revealed in this way can enrich bird-watching and help to give the observations of the field ornithologist new meaning. R. A. HINDE

ACTA VERTEBRATICA, Vol. 1, No. 1, 1957. Published by Almqvist and Wiksell Ltd., Stockholm, for the Nordiska Museet and Skansen. 15 Swedish Kr.

WE WELCOME this new periodical, which will appear at irregular intervals and will normally contain only a single long scientific paper. The Editors are Kai Curry-Lindahl, Bertil Hanström and Bertil Kullenberg and their first issue is devoted to a paper, entirely in English, by Sten Larson, on "The suborder Charadrii in arctic and boreal areas during the Tertiary and Pleistocene: a zoogeographic study".

Concise written in 73 pages, with a bibliography, many tabular charts and 15 excellent maps, this study is of much greater importance than its title might suggest. It reviews with great clarity the advances and retreats of the cold region (defined as tundra north of the arctic timber line), the warm region (defined as extending south from the northern palm limit) and the intermediate temperate region, through the Tertiary and Pleistocene epochs. It traces the effects of these geographical, climatic and

ecological developments on the evolution of species among the waders, on the basis of recent advances in the branches of knowledge concerned, and to some extent links up with Svårdson's recent paper on "The 'invasion' type of bird migration" (*antea*, pp. 314-343) and with Moreau's "Main vicissitudes of the European avifauna since the Pliocene" (*Ibis*, vol. 96, pp. 411-431).

Two very interesting general maps show the extent of maximum glaciation in the northern hemisphere, together with the refuge areas of forest trees during the ice ages, and the present-day circumpolar limits of northern growth for palms and southward occurrence of tundra. Some of the waders (unlike the trees) were most compressed in their distribution by the warm interglacials; two species, the Knot (*Calidris canutus*) and Sanderling (*Crocethia alba*), breed only north of the July isotherm of 5 degrees Centigrade. On the other hand, "sub-cold forms", such as the Whimbrel (*Numenius phaeopus*) and especially the Golden Plover (*Charadrius apricarius*), breed as far south as Britain.

This paper should be examined by all students of speciation and of the background of our present-day bird distributions. *Acta Vertebratica* promises to cover different aspects of vertebrate zoology, chiefly ecology, ethology, zoogeography, evolution, systematics, embryology, wildlife management and conservation, especially in relation to Scandinavian and northern vertebrates. If this first issue is a good sample of the standard to be set, *Acta Vertebratica* is going to prove a most important source of knowledge, which should be widely known. E.M.N.

## LETTERS

### "HARLEQUIN DUCK IN SHETLAND"

SIRS,—In the course of looking over various records of Scottish birds published in 1956, I have carefully studied the record of the "Harlequin Duck in Shetland", reported by Dr. Maeve Rusk and Miss I. M. N. Ryan in *British Birds* (*antea*, vol. xlix, pp. 36-37, plate 4), and have come to the conclusion that this was a case of mistaken identity, and that the bird described was, in fact, a juvenile Long-tailed Duck (*Clangula hyemalis*), not a Harlequin (*Histrionicus histrionicus*).

That there is an unrecognised similarity between the juveniles of these two birds, about which none of the standard reference books gives warning, I discovered a long time ago, when I received a similar individual, dead and pickled in formalin, from Hudson Strait in 1933. It was only after much puzzling on that occasion that I came to the conclusion that my bird could not be a Harlequin at all, and must be a juvenile Long-tail. I inserted for future reference a rough sketch of the head and its light

markings in my copy of *The Practical Handbook*, and now find this quite closely resembles Dr. Rusk's photograph; the corresponding markings are shown at an earlier stage of plumage in the duckling Long-tail which appears in Plate 89 of *The Handbook*.

There is evidently a little individual variation in the extent of the light patches, especially those in front of the eye; but in the Royal Scottish Museum there is a skin of a juvenile Long-tail, one of two collected at Stenness, Orkney, on 26th October 1911, which in facial pattern almost exactly matches the Shetland duck (seen on 16th October 1955).

The authors' description and photograph combined give a very adequate account of their bird. In the photograph the bill clearly shows the broader shape typical of *hyemalis* (width at nostrils 15-15.5 mm.) and not the very narrow tapering form so characteristic of *histrionicus* (width at nostrils 12 mm.). The best character, however, is the white of the lower breast and belly, contrasting with the brown and greyish feathers surrounding it; this is most distinctive of the Long-tail. The Harlequin has the corresponding under-parts barred with dusky-brown on an ashy background, even the palest area being roughly as dark as the Long-tail's head, and thus some considerable way off white (compare Plate 91 of *The Handbook*). Salomonsen (*Birds of Greenland*, p. 105), who is familiar with the resemblance, similarly points out that the female and immature Long-tails have "much more white . . . than the Harlequin Duck with which they can be confused". Lastly, Dr. Rusk and Miss Ryan describe the margins of the white patches on the face as being "less clearly defined than the bird's appearance in the field suggested", whereas in the Harlequin the hinder patch at least appears always to be clean white and sharply marked at all ages.

The measurements given would do for either species: the wing at 197 mm. is 5 mm. below the minimum figure in *The Handbook* for the Long-tailed Duck, but this is not surprising in a juvenile bird. The tarsus-length is likewise somewhat shorter than *The Handbook's* figures for either species.

When recently I brought these facts to the notice of the Scottish records sub-committee of the Scottish Ornithologists' Club they concurred with me in the identification, and it is intended to include a short statement regarding the record in the next annual "Review of Ornithological Changes", to be edited by Dr. Evelyn V. Baxter and published in the *Scottish Naturalist*.

V. C. WYNNE-EDWARDS

[We are very glad to publish Prof. Wynne-Edwards's careful examination of this record and, particularly now that we have taken the opportunity of examining a series of skins ourselves, we are in complete agreement with the conclusion he has reached. Clearly the record must be withdrawn, but this will serve once



more to emphasize the pitfalls that must be avoided in field-identification. We showed Prof. Wynne-Edwards's letter to Dr. Finn Salomonsen of the Copenhagen Museum in view of his special experience of the two species, also to Mr. Peter Scott and to Mr. R. Wagstaffe of the Liverpool Museum. All are in complete agreement with Prof. Wynne-Edwards and particularly endorse his statement about the colour of the under-parts. Dr. Salomonsen writes: "I base my decision especially on the pure white underside which in the Harlequin Duck is always mottled with dark feathers; also, the females of the latter species usually have a larger white patch in front of the head than the specimen shown on the illustration".

Prof. Wynne-Edwards has kindly produced a sketch to illustrate the points in his letter and this is reproduced on plate 64.—EDS.]

### IS THE PHOTOGRAPHY OF BIRDS AN EVIL?

SIRS,—The general criticisms levelled at bird-photography by Mr. P. S. Redman (*antea*, vol. xlix, pp. 509-510) were adequately refuted by the late Commander A. W. P. Robertson in his reply. There remains, however, one small detail which calls for additional comment. Mr. Redman comments—"The publication of a photograph of a Grey Lag Goose, which was taken near its nest, as the front cover of the Annual Report of the senior protection body in Britain can hardly be described as a good example of care when it is remembered how prone this particular species is to desert the nest given the slightest provocation". I think what Mr. Redman is seeking to convey is that he disapproves of Grey Lag Geese being photographed at the nest. The picture to which he refers seems to be a photograph of mine, which was reproduced on the cover of the 1952 Annual Report of the Royal Society for the Protection of Birds. If, however, Mr. Redman can bring himself to look again at this publication, he will find no suggestion that the birds were photographed near the nest. On the contrary, the picture was obtained after a great deal of arduous stalking, combined with a very large element of luck, some forty-eight hours after the brood of goslings had left the nest, and was being conducted by the parents, through deep heather, to a distant lochan.

G. R. SHANNON

### CORMORANTS AND SHAGS "DRYING" THEIR WINGS

SIRS,—The annotation on "Shags drying their wings" (*antea*, p. 33) raises a problem that has interested me for many years. The explanation that Cormorants (*Phalacrocorax carbo*) and Shags (*Ph. aristotelis*) adopting the well-known posture are indeed drying their wings does not appeal to reason and I ask your indulgence to offer another explanation.

It seems so unlikely that of all pelagic species the Cormorants

should need to dry their wings after a spell of diving when Gannets (*Sula bassana*), divers (*Gavia* spp.), grebes (*Podiceps* spp.) and all the other diving birds do not appear to need to do so. *The Handbook* quotes O. Heinroth as explaining this as due to the less effective covering of the Cormorant's wings with contour feathers than in most diving birds, but then sounds a note of caution that this "cannot be the whole explanation". The Cormorants are as well supplied with an oil gland as are other birds and they can render their feathers waterproof by preening quite effectively. A short flight would shake any droplets out of their wings far more effectively than the prolonged periods they are prepared to stand with wings outstretched. If the feathers of their wings did in fact become wet they would be rendered almost incapable of flight. It would appear nonsensical that, after spending perhaps hours "drying their wings", they should then go and wet them again as soon as they took to the water. Finally if one can approach a Cormorant in the "wing-drying" attitude it is quite evident that the wings are not wet.

The explanation I submit is that the Cormorants use their wings for balancing their bodies. The site chosen to indulge the practice is always one with a steady draught of wind. Cormorants prefer to rest on shore, but they also prefer to rest on their tarsi with the body upright. This puts a strain on the crural muscles especially when there are some pounds of fish adding to the weight to be balanced. They thereupon spread their wings and trim them in the breeze so that the upright position is maintained without effort. Again close observation will show that if the breeze is at all irregular the wings are constantly being varied to cope with the varied force of the draught; a little extra puff and the wings are slightly furled and the feathers fanned; a variation in direction and the wings are turned to face the wind. This would explain why they will sit in this attitude for hours, long after their wings should have become dry and why they will sit thus even when spray is blowing on to them. Having learned the use of the spread wings to save effort on shore they may occasionally use them when afloat. They are using them as sails. On the few occasions I have seen the wings used afloat, the wind has been against the current so that the birds could maintain station without the necessity of hard paddling. The conditions described by Mr. C. H. Fry in the note to which I have referred appear to have been just such as would favour use of the wings afloat.

FRANK STABLER



To be published in October

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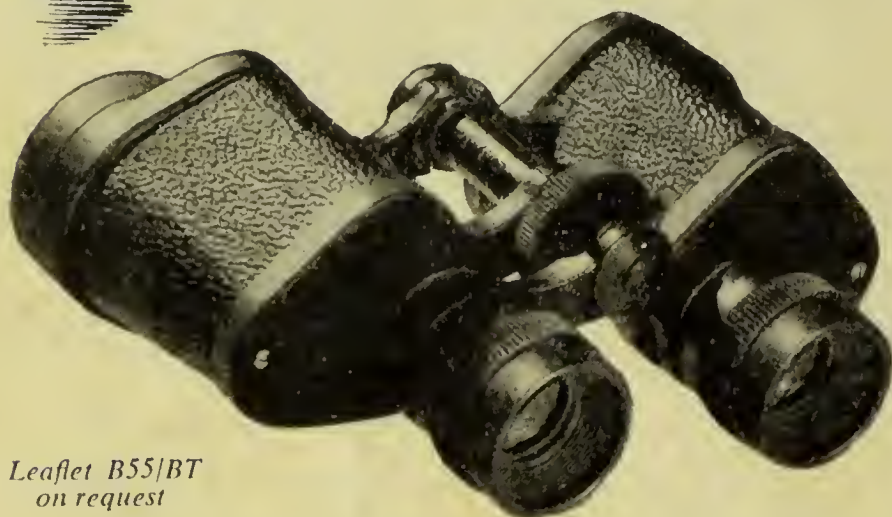
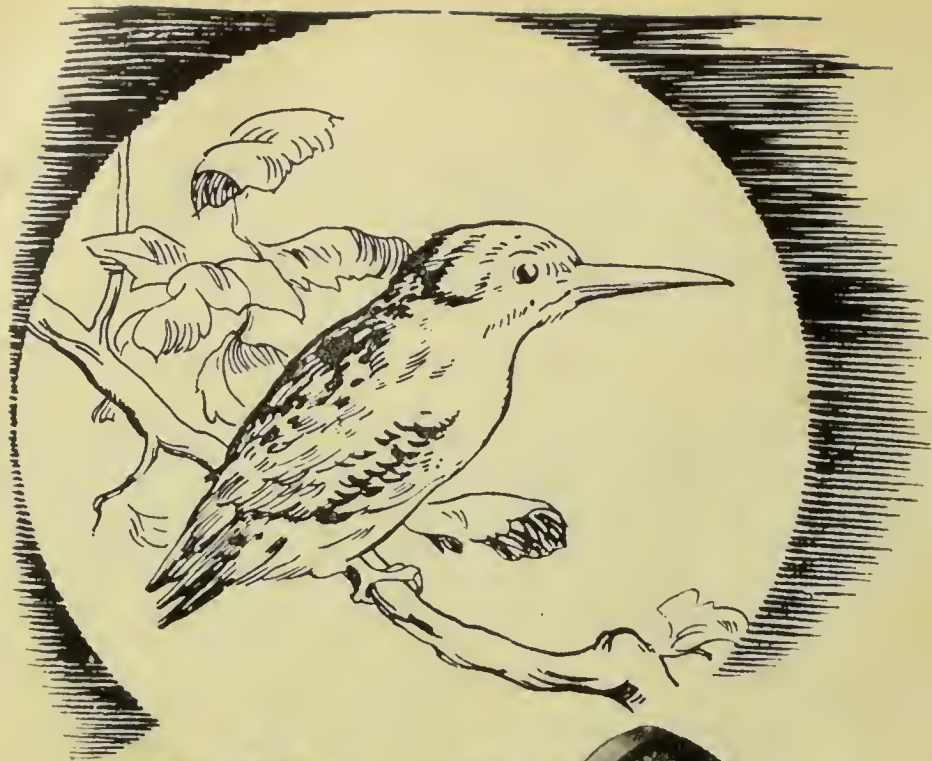
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# BRITISH BIRDS



NOVEMBER 1957

THREE SHILLINGS

# BRITISH BIRDS

AN ILLUSTRATED MONTHLY MAGAZINE

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## CONTENTS OF VOLUME L, NUMBER 11, NOVEMBER 1957

---

	PAGE
Report on bird-ringing for 1956. By Robert Spencer ... ..	449
Photographic studies of some less familiar birds. LXXXIV—Eagle Owl. Photographed by Kurt Ellström and Enar Sjöberg (plates 65-68). Text by Dr. Kai Curry-Lindahl ... ..	486

### Notes:—

Spotted Sandpiper in Norfolk (W. F. Bishop) ... ..	490
Ringed Plover breeding in Hertfordshire (Bryan L. Sage, T. W. Gladwin and J. M. Vaughan) ... ..	491
Blackbirds building unusually large nests (R. D. English) ... ..	491
Robins rearing two broods in an unusual "screened" nest (Mrs. M. Palmer-Smith) ... ..	492

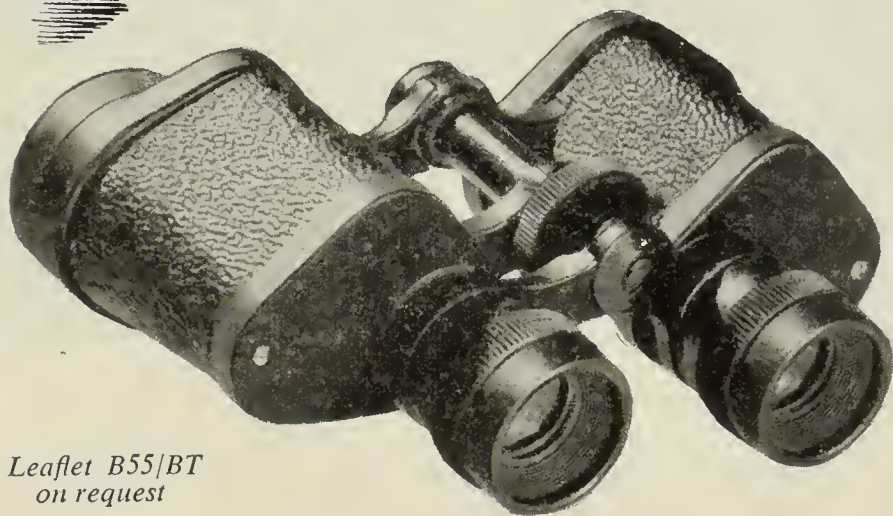
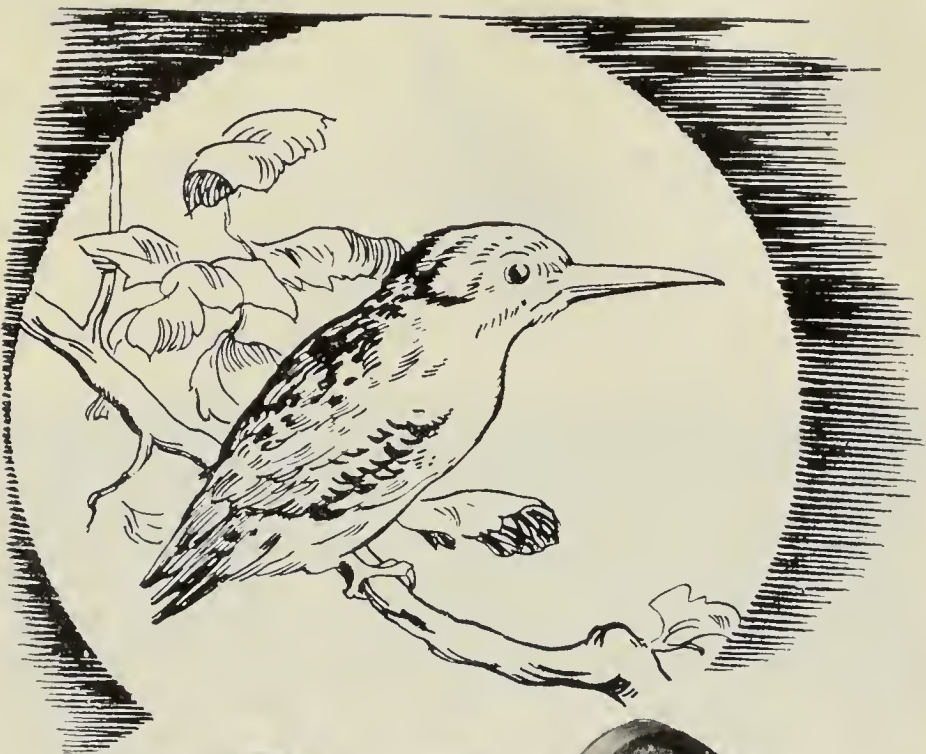
### Reviews:—

<i>Voices of the Wild</i> . By Eric Simms ... ..	492
<i>Wild America</i> . By Roger Tory Peterson and James Fisher ... ..	493

### Requests for Information:—

The abnormal breeding-season of 1957 (Dr. David Lack) ... ..	495
Widespread irruptions of Blue Tits and other species (A. Pettet and J. T. R. Sharrock) ... ..	495
The "wreck" of Kittiwakes in the early part of 1957 (Miss L. McCartan) ... ..	496
The Waxwing invasion of February and March 1957 (R. K. Cornwallis) ... ..	496
The irruption of Crossbills in the autumn of 1956 and breeding in 1957 (F. R. Smith) ... ..	496





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## BRITISH BIRDS

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### REPORT ON BIRD-RINGING FOR 1956\*

By ROBERT SPENCER, B.A.

*Secretary, Bird-Ringing Committee of the  
British Trust for Ornithology*

THE EXPANSION of activities, so much a feature of recent years, was fully maintained in 1956 which was a very successful season. Once again a record number of birds was ringed, and certain administrative and technical developments contributed to the more efficient running of the scheme.

Foremost among the administrative developments was the introduction of a system of ringing permits, as referred to briefly in the nineteenth report. For some years the list of registered ringers had grown steadily longer, but the number of active ringers had shown little or no increase. A stage had been reached when there were almost as many inactive ringers as there were active (most of them holding stocks of rings) and it was clearly desirable to establish an annual revision of the list of officially recognized ringers. No less important, at a time of expanding activities, was the need for a system affording stricter control of the distribution of rings, specially to unauthorized persons. Thanks to the co-operation of ringers, very few difficulties arose during the period of introduction, and the permit system was soon operating smoothly with considerable benefit to the ringing scheme. Details of the numbers and distribution of ringers may be found in Table III, now introduced for the first time.

The loss of rings by birds, and the serious effects of abrasion and corrosion on the legibility of inscriptions, are problems common to most ringing schemes. Factors such as weight and cost, as well as durability, limit the choice of metals available, but during 1956 experimental batches of Size 3 rings were produced in magnesium-aluminium alloy and in Monel, an alloy of nickel. These rings were used mainly on auks, Kittiwakes and

\*This is the twentieth report issued on behalf of the Bird-Ringing Committee, and is a publication of the British Trust for Ornithology. For the nineteenth report see *antea*, pp. 37-72.



skuas—all birds which wear out their rings very quickly. Small quantities of a very big ring, intended for swans and eagles, were also tested during the year. It will, of course, be some time before the efficiency of these new rings is known. The Bird-Ringing Committee are very grateful to the manufacturers, Messrs. Lambournes (B'ham), Ltd., for their assistance and initiative in the production and testing of these rings. The quantities of rings issued in 1956, and in the three preceding years, are given in Table IV, also now introduced for the first time.

Mist nets, a traditional Japanese method of catching birds, were introduced to British ringers at a meeting of the Bird Observatories Committee in January, and by the early autumn of 1956 it is probable that over a hundred nets were in use. Their influence may be discerned in some of the Totals in Table II, and it is clear that they have already claimed an important place among the ringer's equipment. However, the Committee consider that every prospective user of mist nets should first undertake a period of training with a ringer experienced in their safe and efficient management.

A record total of 144,734 birds was ringed in 1956, a fair breeding season and an exceptionally good early autumn passage no doubt being important contributory factors. The influence of weather upon ringing totals is well illustrated in the unusually high figures for Whinchat, Redstart, Bluethroat, Garden Warbler and Pied Flycatcher—all species which featured prominently in an immense movement in the early part of September. For the first time the total of birds trapped in a year exceeded 100,000 and at 40,069 the number of nestlings ringed was also a record. Thirty-two individual totals exceeded 1,000 and four were in excess of 5,000. The bird observatories contributed over 35,000 towards the grand total.

The following species were ringed for the first time in 1956: Semi-palmated Sandpiper (Fair Isle B.O.); Black Tern (Dungeness B.O.); Collared Dove (Cley B.O.); Pallas's Grasshopper Warbler (Fair Isle B.O.) and Rose-coloured Starling (Gibraltar Point B.O.). In addition a Great Grey Shrike of a race new to Britain, *Lanius excubitor pallidirostris*, was ringed at Fair Isle. Unusual numbers of other rare migrants were ringed and details of these appear in the second part of Table II.

At 4,808 the total number of recoveries handled was 745 more than in 1955, and limitations of space available for the publication of details necessitate strict selection. Since ornithologists undertaking analyses would normally need to consult all recoveries, this selection for publication has been made with the interests of the general reader in mind, and tables and maps have been used to summarize and illustrate the movements of certain species. Reference to the list of recoveries and to the recovery column of

Table II will indicate the proportion of recoveries published for each species.

Where so many recoveries are of interest it is difficult to single out some for special mention. First records, perhaps, have a special claim, and in this category come, to mention but a few, the first foreign recovery of a Snow Bunting (later recovered again in Scotland); the first recovery abroad of a London-bred Black Redstart; the first recovery from Bulgaria—a Teal; the first Water Rail from Sweden; and the first recoveries of Ruff and Little Stint. There are interesting records of Cuckoo, Wood Warbler and Lesser Whitethroat in Italy; three species for which previous recoveries have suggested a south-easterly trend. A Pied Wagtail bred in Northumberland was reported in Norway, and there was an interesting movement of a young Guillemot from Lundy to Norway within three months. A Fieldfare ringed in Hertfordshire in late December, and recovered in Spain in early February, would appear to have moved south again at a time of severe weather.

#### FINANCE

The salaries of the secretary and his assistant were again met by a grant from the Nature Conservancy, which was increased to cover also the salary of a shorthand-typist. A subsidy of £50 was received from the main funds of the Trust, and £25 from the publishers of *British Birds*. The full accounts appear in the Annual Report of the British Trust for Ornithology.

#### THE COMMITTEE

The members of the Bird-Ringing Committee on 31st December 1956 were:— Sir Landsborough Thomson (*Chairman*), Miss E. P. Leach, J. S. Ash, A. W. Boyd, Hugh Boyd, E. J. M. Buxton, J. A. Gibb, P. A. D. Hollom, G. R. Mountfort, E. R. Parrinder, Major - General C. B. Wainwright, George Waterston; Bruce Campbell and C. A. Norris (*ex officio*); Robert Spencer (*Secretary*). The late Sir Norman Kinnear represented the Trustees of the British Museum on the Committee. Messrs. Ash, Buxton and Parrinder, all ringers with a wide experience, were appointed to the Committee in December.

#### STAFF

Robert Spencer, J. L. F. Parslow, Miss V. Palmer (January to July) and Miss M. Coleman (from August). Miss E. P. Leach, in an honorary capacity, had charge of all reports of rings from foreign schemes.

#### ACKNOWLEDGEMENTS

Grateful acknowledgement is made to the Trustees for accommodation at the British Museum (Natural History) and for permission to use the address "BRIT. MUSEUM LONDON S.W.7" on the rings; and to the Nature Conservancy for generous financial support. Especial thanks are tendered to

Miss E. P. Leach, who helped on many occasions and in many ways.

#### PUBLICATIONS

The following analysis of results has been published:

- A. Landsborough Thomson: "The migration of British chats (*Oenanthe Saxicola*, *Phoenicurus*) as shown by the results of ringing". *Brit. Birds*, xlix: 63-73.

The following papers make use of the recoveries of the scheme:

- J. S. Ash, M. W. Ridley and N. Ridley (1956): "On the movements and survival of Woodpigeons and Stock Doves". *Brit. Birds*, xlix: 298-305.  
 J. C. Coulson (1956): "Mortality and egg production of the Meadow Pipit with special reference to altitude". *Bird Study*, 3: 119-132.  
 R. E. Moreau (1956): "The Iberian Peninsula and migration". *Bird Study*, 3: 1-25.  
 D. Summers-Smith (1956): "Mortality of the House Sparrow". *Bird Study* 3: 265-270.  
 D. Summers-Smith (1956): "Movements of House Sparrows". *Brit. Birds*, xlix: 465-488.

In addition, the following report is relevant:

- E. P. Leach (1956): "British recoveries of birds ringed abroad". *Brit. Birds*, xlix: 438-452.

For particulars of the ringing and recovery of ducks and geese, see also:

- Peter Scott and Hugh Boyd (1957): *Eighth Annual Report of the Wildfowl Trust, 1954-56*.

### Table I

#### NUMBER OF BIRDS RINGED

	<i>Juv.-Ad.</i>	<i>Pullus†</i>	<i>Total</i>
1956 .....	104,665	40,069	144,734
1955 .....	90,585	35,718	126,303
1954 (1.10.53-31.12.54)* .....	77,809	36,684	114,493
1953 .....	63,318	35,199	98,517
1952 .....	56,867	39,459	96,326
1951 .....	49,364	36,379	85,743
1950 .....	42,112	33,994	76,106
1949 .....	27,496	29,965	57,461
1948 .....	18,413	20,911	39,324
1947 .....	14,574	14,007	28,581
Grand Total 1909-1956 ( <i>including arrears</i> )			1,626,286

† An explanation of the term "pullus" or "pull." appears on page 459.

\* The ringing year formerly began on 1st October. In 1954 it was decided to make it coincide with the calendar year, and there was accordingly a "year" of 15 months.



Table II

## RINGING AND RECOVERY TOTALS TO 31.12.56

(Save for a limited number of races, generally identifiable in the field and traditionally treated trinomially (e.g. wagtails), subspecies have been "lumped.")

It has been found necessary to omit from the two recovery columns the retraps—records of birds caught again locally and released—of which large numbers exist for certain species, especially "garden birds".)

	<i>Ringed</i>				<i>Recovered</i>	
	<i>Juv.-Ad.</i>	<i>Pull.</i>	<i>1956 Total</i>	<i>Grand Total</i>	<i>1956</i>	<i>Grand Total</i>
Little Grebe ...	13	2	15	111	1	6
Leach's Petrel ...	7	—	7	240	—	—
Storm Petrel... ..	299	42	341	2,713	3	8
Manx Shearwater ...	3,566	1,511	5,077	65,579	49	684
Fulmar ... ..	154	493	647	3,242	4	31
Gannet ... ..	32	747	779	17,071	39	677
Cormorant ... ..	1	184	185	4,073	53	939
Shag ... ..	101	453	554	5,073	61	535
Heron... ..	—	139	139	3,589	51	532
Mallard ... ..	1,405	93	1,498	17,040	336	1,921
Teal ... ..	3,046	8	3,054	21,421	639	3,305
Wigeon ... ..	207	—	207	1,785	50	289
Pintail ... ..	43	—	43	430	11	78
Shoveler ... ..	30	1	31	350	16	74
Tufted Duck... ..	100	—	100	665	11	141
Pochard ... ..	29	—	29	128	1	22
Eider ... ..	3	—	3	996	3	53
Shelduck ... ..	—	47	47	619	2	33
Grey Lag Goose ...	—	—	—	440	23	108
White-fronted Goose	1	—	1	254	9	72
Pink-footed Goose ...	1,093	—	1,093	5,753	183	1,128
Canada Goose ...	190	—	190	575	15	32
Buzzard ... ..	2	23	25	844	3	42
Sparrowhawk ... ..	17	12	29	1,254	3	185
Hen Harrier ... ..	—	15	15	271	5	39
Montagu's Harrier ...	—	15	15	201	6	28
Peregrine ... ..	1	3	4	155	—	22
Merlin ... ..	12	11	23	532	4	79
Kestrel ... ..	17	92	109	1,982	17	227
Red Grouse ... ..	51	—	51	313	—	9
Water Rail ... ..	21	1	22	197	1	7
Corncrake ... ..	5	—	5	689	—	11
Moorhen ... ..	343	54	397	3,975	15	101
Coot ... ..	127	4	131	1,241	37	112
Oystercatcher ... ..	38	285	323	4,859	13	233
Lapwing ... ..	217	2,632	2,849	62,458	76	1,253
Ringed Plover ... ..	41	137	178	3,379	4	45
Little Ringed Plover	2	26	28	128	1	4
Golden Plover ... ..	—	21	21	490	—	16
Turnstone ... ..	61	—	61	234	1	4
Snipe ... ..	105	45	150	2,783	11	130
Woodcock ... ..	9	7	16	5,606	2	428
Curlew ... ..	3	258	261	5,779	10	232
Common Sandpiper... ..	198	67	265	2,870	1	16
Redshank ... ..	75	167	242	4,430	5	127
Dunlin ... ..	217	7	224	801	1	7
Stone Curlew ... ..	—	9	9	347	—	17

	<i>Ringed</i>				<i>Recovered</i>	
	<i>Juv.-Ad.</i>	<i>Pull.</i>	<i>1956 Total</i>	<i>Grand Total</i>	<i>1956</i>	<i>Grand Total</i>
Arctic Skua ... ..	20	65	85	563	10	18
Great Skua ... ..	1	75	76	1,193	1	35
Great Black-backed Gull ... ..	84	165	249	1,624	14	80
Lesser Black-backed Gull ... ..	15	990	1,005	19,065	39	753
Herring Gull ... ..	225	867	1,092	21,099	44	750
Common Gull ... ..	174	121	295	4,186	9	167
Black-headed Gull ...	193	3,058	3,251	36,694	172	1,623
Kittiwake ... ..	841	927	1,768	9,017	28	141
Common Tern ... ..	—	429	429	25,830	7	519
Arctic Tern ... ..	1	788	789	10,422	12	91
Roseate Tern ... ..	—	—	—	2,503	—	21
Little Tern ... ..	4	45	49	1,605	1	15
Sandwich Tern ... ..	—	1,248	1,248	28,076	20	439
Razorbill ... ..	81	333	414	9,104	18	229
Guillemot ... ..	113	172	285	5,837	17	196
Black Guillemot ... ..	11	19	30	362	—	4
Puffin ... ..	529	197	726	10,352	8	51
Stock Dove ... ..	23	55	78	1,761	7	109
Woodpigeon ... ..	57	205	262	6,153	42	379
Turtle Dove ... ..	55	39	94	1,308	10	40
Cuckoo ... ..	55	28	83	1,610	3	38
Barn Owl ... ..	7	14	21	1,104	3	136
Little Owl ... ..	12	19	31	1,358	4	109
Tawny Owl ... ..	10	92	102	2,192	12	141
Long-eared Owl ... ..	4	24	28	443	2	24
Short-eared Owl ... ..	—	4	4	308	—	21
Nightjar ... ..	3	8	11	358	—	8
Swift ... ..	791	133	924	4,234	10	63
Kingfisher ... ..	8	6	14	853	—	35
Green Woodpecker ...	16	3	19	337	—	9
Great Spotted Wood- pecker ... ..	42	4	46	503	4	21
Wryneck ... ..	36	1	37	485	—	9
Woodlark ... ..	1	25	26	303	—	2
Skylark ... ..	288	235	523	7,187	4	41
Swallow ... ..	521	3,005	3,526	72,000	54	482
House Martin ... ..	301	49	350	16,608	1	127
Sand Martin ... ..	2,858	11	2,869	11,276	6	28
Raven ... ..	1	57	58	671	2	62
Carriion Crow ... ..	11	117	128	3,033	8	169
Hooded Crow ... ..	—	20	20	222	—	10
Rook ... ..	144	482	626	7,996	78	438
Jackdaw ... ..	255	355	610	8,128	31	398
Magpie ... ..	43	102	145	2,601	6	103
Jay ... ..	50	39	89	1,413	12	93
Chough ... ..	—	24	24	190	1	7
Great Tit ... ..	2,039	1,010	3,049	31,427	42	533
Blue Tit ... ..	5,873	1,628	7,501	62,870	133	1,121
Coal Tit ... ..	178	177	355	3,899	5	55
Marsh Tit ... ..	93	14	107	1,267	1	15
Willow Tit ... ..	18	—	18	139	—	—
Long-tailed Tit ... ..	81	1	82	476	2	2
Nuthatch ... ..	50	30	80	1,552	1	37
Treecreeper ... ..	37	16	53	1,103	1	1
Wren ... ..	549	20	569	7,733	5	31

		Ringed				Recovered	
		Juv.-Ad.	Pull.	1956 Total	Grand Total	1956	Grand Total
Dipper ...	...	25	205	230	3,357	6	43
Mistle Thrush ...	...	282	236	518	8,293	20	195
Fieldfare ...	...	237	—	237	736	12	18
Song Thrush ...	...	1,991	1,716	3,707	97,882	166	2,205
Redwing ...	...	483	—	483	3,169	6	34
Ring Ouzel ...	...	42	60	102	1,257	2	16
Blackbird ...	...	6,590	2,964	9,554	124,965	429	3,935
Wheatear ...	...	1,492	184	1,676	10,062	6	39
Stonechat ...	...	67	20	87	1,774	—	11
Whinchat ...	...	346	220	566	4,094	2	12
Redstart ...	...	933	329	1,262	8,050	2	16
Black Redstart ...	...	63	19	82	418	4	10
Nightingale ...	...	64	42	106	3,198	2	13
Robin... ..	...	2,729	611	3,340	54,358	85	1,238
Grasshopper Warbler	...	82	5	87	383	1	1
Reed Warbler ...	...	177	141	318	2,539	—	9
Sedge Warbler ...	...	1,176*	149	1,325	6,443	2	10
Blackcap ...	...	141	36	177	2,366	1	8
Garden Warbler ...	...	523	39	562	3,075	2	4
Whitethroat ...	...	4,019	641	4,660	24,637	19	85
Lesser Whitethroat ...	...	279	8	287	1,697	1	3
Willow Warbler ...	...	3,682	883	4,565	35,695	4	88
Chiffchaff ...	...	1,257	52	1,309	5,672	1	12
Wood Warbler ...	...	7	86	93	1,956	1	11
Goldcrest ...	...	293	—	293	1,768	1	5
Spotted Flycatcher ...	...	327	320	647	8,665	6	55
Pied Flycatcher ...	...	548	646	1,194	9,869	8	22
Dunnoek ...	...	2,451	584	3,035	33,299	43	447
Meadow Pipit ...	...	1,741	294	2,035	15,066	14	120
Tree Pipit ...	...	113	84	197	3,107	—	7
Rock Pipit ...	...	804	69	873	4,583	5	31
Pied Wagtail... ..	...	650	303	953	13,317	28	205
White Wagtail ...	...	15	2	17	111	—	1
Grey Wagtail ...	...	39	103	142	1,914	2	9
Yellow Wagtail ...	...	719	182	901	5,149	16	35
Red-backed Shrike ...	...	42	117	159	1,649	1	7
Starling ...	...	22,732	811	23,543	188,250	889	6,566
Hawfinch ...	...	—	4	4	160	—	2
Greenfinch ...	...	4,613	357	4,970	57,747	93	762
Goldfinch ...	...	71	28	99	1,663	3	14
Siskin ...	...	39	3	42	120	1	2
Linnet ...	...	1,136	498	1,634	22,086	10	146
Twite ...	...	185	6	191	1,456	1	6
Lesser Redpoll ...	...	8	19	27	825	—	8
Bullfinch ...	...	134	112	246	3,021	10	45
Crossbill ...	...	13	—	13	152	—	2
Chaffinch ...	...	2,848	527	3,375	60,718	69	677
Brambling ...	...	235	—	235	2,813	2	21
Yellowhammer ...	...	484	304	788	10,968	6	89
Corn Bunting ...	...	75	16	91	431	7	8
Cirl Bunting ...	...	1	—	1	132	—	—
Reed Bunting ...	...	748	232	980	6,780	5	29
Snow Bunting ...	...	462	—	462	852	3	3
House Sparrow ...	...	7,120	373	7,493	42,462	126	571
Tree Sparrow ...	...	308	223	531	4,891	1	35

\* A bird considered at the time of ringing to be a Moustached Warbler (*Luscinola melanopogon*), but for which incomplete evidence is available, is included in this total.



## SPECIES OF WHICH LESS THAN 100 HAVE BEEN RINGED

(1956 total, grand total, 1956 recoveries and grand total recoveries are given in that order)

Black-throated Diver	—	1	—	—	Sanderling ...	14	50	—	—
Great Northern Diver	—	2	—	—	Buff-breasted Sand-				
Red-throated Diver	—	6	—	3	piper ...	—	1	—	—
Great Crested Grebe	2	22	—	—	Ruff ...	23	50	1	1
Red-necked Grebe	—	1	—	—	Grey Phalarope ...	—	3	—	—
Slavonian Grebe ...	—	1	—	—	Red-necked Phala-				
Wilson's Petrel ...	—	1	—	—	rope ...	—	21	—	—
Little Bittern ...	—	1	—	—	Glaucous Gull ...	—	2	—	1
Bittern ...	—	45	—	6	Little Gull ...	—	1	—	1
Garganey ...	7	82	—	9	Black Tern...	1	1	—	—
Gadwall ...	8	87	4	12	Gull-billed Tern ...	—	1	—	1
Red-crested Pochard	—	8	—	3	Little Auk ...	1	13	—	1
Scaup ...	8	20	2	2	Rock Dove...	26	99	—	3
Goldeneye ...	—	5	—	—	Collared Dove	2	2	—	—
Long-tailed Duck ...	—	2	—	—	Scops Owl ...	—	1	—	—
Velvet Scoter ...	—	1	—	1	Snowy Owl ...	—	1	—	—
Common Scoter ...	1	9	—	1	Hoopoe ...	1	3	—	—
Red-breasted Mer-					Lesser Spotted				
ganser ...	1	10	—	1	Woodpecker ...	—	55	—	—
Goosander ...	1	53	—	10	Short-toed Lark ...	—	1	—	—
Smew ...	—	1	—	—	Shore Lark...	—	1	—	—
Brent Goose ...	1	2	1	1	Golden Oriole ...	—	1	—	—
Barnacle Goose ...	—	3	—	1	Crested Tit...	2	35	—	—
Mute Swan...	24	68	5	8	Bearded Tit ...	—	47	—	—
Whooper Swan ...	—	3	1	2	American Robin ...	—	1	—	—
Golden Eagle ...	1	20	—	—	Siberian Thrush ...	—	1	—	—
Marsh Harrier ...	12	96	1	7	Gray-cheeked Thrush	—	1	—	—
Hobby ...	—	48	—	—	Desert Wheatear ...	—	2	—	—
Red-footed Falcon	—	1	—	—	Black-eared				
Black Grouse ...	—	3	—	—	Wheatear ...	—	1	—	—
Capercaillie ...	—	3	—	—	Pied Wheatear ...	—	1	—	—
Red-legged Partridge	6	20	—	1	Bluethroat ...	38	84	—	—
Partridge ...	3	82	—	2	Pallas's Grasshopper				
Quail ...	—	3	—	—	Warbler ...	1	1	—	—
Pheasant ...	2	58	—	4	Marsh Warbler ...	4	46	—	—
Spotted Crake ...	—	4	—	—	Paddyfield Warbler	—	1	—	—
Kentish Plover ...	—	1	—	—	Aquatic Warbler ...	3	6	—	—
Grey Plover ...	—	2	—	1	Thick-billed Warbler	—	1	—	—
Dotterel ...	2	25	—	—	Melodious Warbler	3	10	—	—
Jack Snipe ...	22	70	1	3	Icterine Warbler ...	3	36	—	—
Whimbrel ...	1	80	—	—	Olivaceous Warbler	1	2	—	—
Bar-tailed Godwit...	9	19	—	—	Barred Warbler ...	12	82	—	—
Green Sandpiper ...	12	57	—	—	Orphan Warbler ...	—	1	—	—
Wood Sandpiper ...	10	34	—	—	Subalpine Warbler	—	5	—	—
Spotted Redshank	3	9	—	1	Dartford Warbler...	1	41	—	—
Greenshank ...	5	32	—	1	Greenish Warbler ...	1	6	—	—
Knot ...	31	51	1	2	Bonelli's Warbler ...	—	1	—	—
Purple Sandpiper ...	5	19	—	—	Arctic Warbler ...	—	1	—	—
Little Stint ...	12	30	1	1	Yellow-browed				
Temminck's Stint...	2	3	—	—	Warbler ...	3	29	—	—
White-rumped					Pallas's Warbler ...	—	1	—	—
Sandpiper ...	—	1	—	—	Yellowthroat ...	—	1	—	—
Pectoral Sandpiper	—	2	—	—	Firecrest ...	4	27	—	—
Curlew Sandpiper...	17	33	—	—	Red-breasted Fly-				
Semi-palmated					catcher ...	1	38	—	—
Sandpiper ...	1	1	—	—	Tawny Pipit ...	1	2	—	—

Blue-headed Wagtail	2	13	—	—	Scarlet Grosbeak ...	—	8	—	—
Yellow-headed Wagtail ...	—	2	—	—	Pine Grosbeak ...	—	1	—	—
Waxwing ...	—	7	—	—	Black-headed Bunting	—	1	—	—
Great Grey Shrike	3*	30	—	1	Red-headed Bunting	—	2	—	—
Lesser Grey Shrike	1	4	1	2	Yellow-breasted Bunting ...	—	1	—	—
Woodchat Shrike ...	5	13	—	—	Ortolan Bunting ...	6	13	—	—
Rose-coloured Starling	1	1	—	—	Rustic Bunting ...	—	1	—	—
Mealy Redpoll ...	—	18	—	—	Little Bunting ...	1	3	—	—
Greenland Redpoll	2	29	—	1	Lapland Bunting ...	8	30	—	—

\*Includes one individual of the desert race *L.s.pallidirostris* (antea, pp.246-249).

Table III

NUMBER AND DISTRIBUTION OF RINGERS (as at 31.12.56)

ENGLAND					SCOTLAND				
County	Category of permit				County	Category of permit			
	A	B	C	Total		A	B	C	Total
Bedfordshire ...	4	—	3	7	Aberdeenshire ...	1	1	1	3
Berkshire ...	12	2	5	19	Angus ...	2	1	—	3
Buckinghamshire ...	8	—	1	9	Ayrshire ...	1	—	—	1
Cambridgeshire ...	2	1	1	4	Berwickshire ...	3	—	—	3
Cheshire ...	12	—	6	18	Dumfries-shire ...	3	—	—	3
Cumberland ...	3	—	1	4	Dunbartonshire ...	1	—	—	1
Derbyshire ...	4	—	2	6	Fife ...	2	—	—	2
Devon ...	8	1	—	9	Inverness-shire ...	4	—	—	4
Dorset ...	5	3	2	10	Kirkcudbrightshire ...	2	—	—	2
Durham ...	12	2	1	15	Lanarkshire ...	3	—	—	3
Essex ...	35	1	6	42	Midlothian ...	12	5	1	18
Gloucestershire ...	5	2	1	8	Orkney ...	1	—	—	1
Hampshire ...	13	1	2	16	Perthshire ...	1	—	—	1
Herefordshire ...	2	—	—	2	Ross ...	1	—	—	1
Hertfordshire ...	6	—	—	6	Roxburghshire ...	1	—	—	1
Kent ...	26	—	2	28	Shetland ...	—	2	—	2
Lancashire ...	23	—	2	25	Stirlingshire ...	2	—	—	2
Leicestershire ...	3	6	—	9	Sutherland ...	1	—	—	1
Lincolnshire ...	7	—	1	8	Wigtownshire ...	1	—	—	1
London ...	13	2	2	17					
Middlesex ...	5	4	1	10					
Norfolk ...	5	7	1	13					
Northamptonshire ...	4	1	1	6					
Northumberland ...	2	6	3	11					
Nottinghamshire ...	4	—	—	4					
Oxfordshire ...	8	5	1	14					
Shropshire ...	3	—	—	3					
Somerset ...	11	—	2	13					
Staffordshire ...	8	—	—	8					
Suffolk ...	8	4	—	12					
Surrey ...	27	6	2	35					
Sussex ...	14	1	1	16					
Warwickshire ...	9	1	5	15					
Westmorland ...	5	—	1	6					
Wiltshire ...	1	—	—	1					
Worcestershire ...	4	—	—	4					
Yorkshire ...	40	9	6	55					

WALES				
County	Category of permit			
	A	B	C	Total
Caernarvonshire ...	1	—	—	1
Cardiganshire ...	2	—	—	2
Car-mar-thenshire ...	1	—	—	1
Den-bighshire ...	2	—	—	2
Glamorgan ...	2	—	—	2
Montgomeryshire ...	1	—	—	1
Pembrokeshire ...	1	4	—	5

IRELAND				
County	Category of permit			
	A	B	C	Total
Antrim ...	6	3	—	9
Down ...	2	—	—	2
Dublin ...	4	—	—	4
Mayo ...	—	1	—	1

Isle of Man				
	Category of permit			
	A	B	C	Total
Isle of Man ...	3	—	4	7

Table IV

## APPROXIMATE TOTALS OF RINGS ISSUED ANNUALLY

	<i>Ring Size</i>								
	I	IA	2	3	D.E.	4	Cl.4	G.H.	5
1956	79,000	59,600	9,000	14,200*	8,500	3,300	250	2,800	1,400
1955	55,000	45,800	7,000	8,200	9,100	2,100	350	2,400	1,500
1954	54,700	38,200	5,700	9,600	8,700	4,700	1,000	1,800	1,000
1953	44,000	35,300	7,100	9,300	4,600	3,400	650	500	—

\*This increase is to some extent accounted for by the fact that in 1956 the Wildfowl Trust used standard No. 3 rings for Teal and other small ducks, in place of the former special Teal ring, omitted from this Table.

## KEY TO RINGERS' INITIALS

DRA	D. R. Anderson	MHBO	Monks' House Bird Ob-
RWA	R. W. Arthur		servatory
SMDA	S. M. D. Alexander	SBO	Skokholm Bird Observatory
AWB	A. W. Boyd	IDP	I. D. Pennie
HB	H. Barlow	IVBP	I. V. Balfour Paul
HVDB	H. Van den Bos	RP	R. Perry
JAB	J. A. Benington	RHP	R. H. Poulding
JJB	J. J. Boon	PAR	P. A. Rayfield
PSB	P. S. Burns	RR	R. Redfern
RMB	R. M. Band	BS	Bootham School
DBC	Dingle Bird Club	CS	Charterhouse School
DFC	Dublin Field Club	ESS	E. S. Skinner
DMC	D. M. Cormack	HSS	Halifax Sci. Society
GBC	G. B. Corbet	IFS	I. F. Stewart
GEC	G. E. Clothier	LNHS	London Nat. Hist. Society
JCC	J. C. Coulson	OOS	Oxford Orn. Society
JEC	J. E. Cordingley	RS	R. Spencer
LHBC	Lynford Hall Bird Club	RSt.	R. Stokoe
PJC	P. J. Chadwick	RRS	Romford Ringing Station
DD	D. Dandridge	SBRS	Sandwich Bay Ringing Station
EAD	E. A. Duffey	SS	Sedbergh School
RSD	R. S. Dove	SWLS	S. W. L. Shippey
JCSE	J. C. S. Ellis	WNS	Wharfedale Naturalists' Society
RE	R. Elmes		
WJE	W. J. Eggeling	WWFS	West Wales Field Society
FCG	F. C. Gribble	ST	Steepleholme Trust
HG	H. Gemmell	TT	T. Todd
DFH	D. F. Harle	AEV	A. E. Vine
DBI	D. B. Iles	DRW	D. R. Wilson
EGI	Edward Grey Institute	A&S	Ash & Ridley
AHJ	A. H. Johnson	B&T	Bilby & Taylor
ECMK	Mrs. E. C. M. Knowles	C&C	Campbell & Campbell
JEK	J. E. King	CC&M	Cowin, Crellin & Moss
RAFK	R. A. F. Kemp	C&W	Coulson & White
FL	F. Lexster	F&M	Flegg & Musson
JL	J. Lees	HE&W	Hurrell, Ebert & Waite
JWL	J. W. Lund	L&R	Leicester & Rutland Orn. Society
AEM	A. E. Male		
JM	J. MacGeoch	ND&N	Northumberland, Durham and Newcastle N.H.S.
JRM	J. R. Mather	R&W	Raynsford & Weller
RVAM	R. V. A. Marshall	Sa&W	Sanderson & Walker
WM	W. Murray	Sm&W	Smith & Walker
JAN	J. A. Nelder	T&H	Thearle & Hobbs
BBO	Bradwell Bird Observatory		
CBO	Cley Bird Observatory		
DBO	Dungeness Bird Observatory		

NOTE.—Ringers' initials are omitted when the ringing was carried out: (i) at an observatory (Bardsey, Cley, Copeland, Dungeness, Fair Isle, Gibraltar Point, Lundy, Isle of May, Portland, Great Saltee, Skokholm and Spurn); (ii) at Abberton Reservoir—where all ringing is carried out by Major-General C. B. Wainwright; (iii) by the Wildfowl Trust (nearly all ducks and geese).



## Selected List of Recoveries Reported during 1956

### Key to Symbols and Terms

- Ring Number : Where this is in italics the ring has been returned.  
 O : Indicates bird breeding, or bred, at place of ringing.  
 Age : pull. (pullus)—nestling or chick, *not yet flying* ;  
       juv.—young, *able to fly freely* ;  
       1stW.—bird in its first winter ;  
       f.g.—full-grown, age uncertain ;  
       ad.—adult.  
 Sex : ♂—male ; ♀—female.  
       v : Caught or trapped, and released with ring.  
       + : Shot or killed by man.  
       × : Found dead or dying.  
       () : Caught or trapped alive, and not released, or released but with  
           ring removed.  
       /? : Manner of recovery unknown.  
 Date of Recovery : Where this is unknown the date of the report is given in  
                       brackets.  
 Distance : The distances, given in miles, and the directions, are approxi-  
                       mate.

NOTE : The form of this report, and the symbols and terms employed are those put  
 forward for international adoption at the XIth International Ornithological Congress. In  
 the following list ringing details are given on the first or first and second lines with recovery  
 date on a new line below.

### Little Grebe (*Podiceps ruficollis*)

51476 1stW. 2.11.52 Abberton : 51°50'N. 0°53'E. (Essex)  
 × (long dead) (7.6.56) Castricum : 52°33'N. 4°40'E. (N. Holland)

### Storm Petrel (*Hydrobates pelagicus*)

12179 O ad. 10.7.55 Inishvickillane : 52°03'N. 10°36'W., Blasket Isles (Kerry)  
       DFC  
       v 28.1.56 Off Mauritania : 19°08'N. 16°35'W.  
 A1186 O pull. 16.9.56 Skokholm : 51°42'N. 5°16'W. (Pembrokeshire)  
       /? - end 12.56 Off Belle Ile : 47°20'N. 3°10'W. (Morbihan) France  
 A805 O pull. 14.9.55 Skokholm  
       × 4.8.56 Widemouth (Cornwall) 70m. S.S.E.

### Manx Shearwater (*Procellaria puffinus*)

T36220 O pull. 25.8.56 Copeland : 54°40'N. 5°32'W. (Down)  
       /? 21.12.56 Albardão : 33°12'S. 52°42'W. (Rio Grande do Sul)  
               Brazil  
 T28005 f.g. 2.6.56 Bardsey : 52°46'N. 4°48'W. (Caernarvonshire)  
       × 6.9.56 Off Mull of Kintyre (Argyll) 180m. N.N.W.  
 T28119 f.g. 12.7.56 Bardsey  
       × ca.8.8.56 Nr. Silloth (Cumberland) 150m. N.N.E.  
 T22790 ad. 9.4.56 Great Saltee : 52°07'N. 6°35'W. (Wexford)  
       × 24.4.56 Skomer (Pembrokeshire) 60m. E.S.E.  
 T21873 ad. 26.6.54 Skokholm : 51°42'N. 5°16'W. (Pembrokeshire)  
       × 5.6.56 Silloth (Cumberland) 230m. N.N.E.  
 T17513 O pull. 9.9.53 Skokholm  
       × 8.7.56 Walney (Lancashire) 190m. N.E.

AT36220 is the first South American recovery of a Manx Shearwater ringed  
 away from the Skokholm colony. There is only one more southerly recovery.  
 The other recoveries are selected as showing interesting movements within  
 British waters. Nineteen recoveries from French waters between March and  
 July do not call for comment.

**Fulmar** (*Fulmarus glacialis*)

AT27276	O	pull.	21.8.54	Sula Sgeir : 59°06'N. 6°10'W., Outer Hebrides	JM
	()		20.7.55	At sea off Trondheim : 64°08'N. 8°02'E.	Norway
AT27465	O	pull.	23.8.54	Sula Sgeir	JM
	[?]		10.9.54	At sea off Ireland : ca. 52°50'N. 11°00'W.	
AT33853	O	pull.	15.8.55	Duncansby Head : 58°39'N. 3°01'W. (Caithness)	DMC
	[?]		21.5.56	Cabot Strait : 47°36'N. 60°35'W., Gulf of St. Lawrence	Canada.

**Gannet** (*Sula bassana*)

516170	O	pull.	8.7.56	Bass Rock : 56°04'N. 2°38'W. (East Lothian)	JEK
	×		11.11.56	Camber (Sussex) 380m. S.S.E.	
516326	O	pull.	8.7.56	Bass Rock.	JEK
	×		14.10.56	St. Agnes (Cornwall) 410m. S.S.W.	
516249	O	pull.	8.7.56	Bass Rock.	JEK
	×	ca.	31.10.56	Carnsore Point (Wexford) 310m. S.W.	
515875	O	pull.	9.8.56	Bass Rock.	IVBP
	()		12.11.56	At sea nr. The Skelligs (Kerry) 440m. S.W.	
514741	O	pull.	10.7.55	Bass Rock.	JEK
	+		(20.10.56)	Off Kristiansand : 58°08'N. 8°01'E. (Vest Agder)	Norway
512134	O	pull.	1.8.54	Ailsa Craig : 55°13'N. 5°07'W. (Ayrshire).	PJC
	+		6.10.56	Nr. Oksö : 58°06'N. 8°09'E. (Vest Agder)	Norway
506035		ad.	23.5.52	Grassholm : 51°44'N. 5°29'W. (Pembrokeshire)	SBO
	[?]		0.6.56	Longeville : 46°26'N. 1°29'W. (Vendée)	France

In addition to the foregoing, recoveries were reported in the late autumn and winter as follows : France 5, Iberia 9, North Africa 6.

**Cormorant** (*Phalacrocorax carbo*)

126230	O	pull.	13.6.39	Lambay : 53°29'N. 6°01'W. (Dublin)	SBO
	()	ca.	0.7.56	L. Muckno, Castleblayney (Monaghan)	50m. N.W.

Three birds each from the Isle of Man and Pembrokeshire, and one from Devon were recovered on the north coast of France during the winter months. One bird from Anglesey was reported in Spain in its third winter. There were 45 recoveries in home waters at distances up to 300 miles, the general trend for birds from the west coast colonies being south and eastwards into the English Channel, while birds from the Farne Islands show a marked movement north west into the Firth of Forth.

**Shag** (*Phalacrocorax aristotelis*)

131983	O	pull.	8.7.56	St. Kilda : 57°49'N. 8°34'W. Outer Hebrides.	DRW
	+		6.8.56	Fuday, Barra, Outer Hebrides 65m. S.E.	
131693	O	pull.	26.6.55	Isle of May : 56°11'N. 2°33'W. (Fife)	
	×	ca.	14.2.56	Benwick, nr. March (Cambridgeshire) 275m. S.S.E.	
132562	O	pull.	10.7.55	Bass Rock : 56°04'N. 2°38'W. (East Lothian)	JEK.
	v		10.8.56	Maidenhead (Berkshire) 330m. S.S.E.	
132665	O	pull.	14.7.55	Farne Islands : 55°37'N. 1°37'W. (Northumberland)	ND&N
	v		16.2.56	Ongar (Essex) 280m. S.S.E.	

Eight Shags ringed on Lundy were recovered in northern France during their first and second winters, the extreme dates being August and May.

**Heron (*Ardea cinerea*)**

05149	O	pull.	19.5.53	Wytham : 51°47'N. 1°19'W. (Berkshire) EGI
	+		Spring 1956	Carentan : 49° 18'N. 1°14'W. (Manche) <b>France</b>
12671	O	pull.	14.5.56	Wytham. EGI
	×	(long dead)	16.12.56	Hornby (Lancashire) 170m. N.N.W.
12639	O	pull.	5.6.55	High Halstow : 51°22'N. 0°41'E. (Kent). EGI
	×		5.2.56	Nr. Birmingham (Warwickshire) 115m. N.W.
12643	O	pull.	5.6.55	High Halstow. EGI
	×		ca.7.1.56	Overbury (Worcestershire) 120m. W.N.W.

**Mallard (*Anas platyrhynchos*)**

37764		juv.	20.7.55	Abberton : 51°50'N. 0°53'E. (Essex)
	()		5.9.56	Seine estuary : ca. 49°27'N. 0°15'E. <b>France</b>
37779	O	pull.	20.7.55	Abberton
	×	(long dead)	10.6.56	Drimmelen : 51°42'N. 4°48'E. (Noord-Brabant) <b>Holland</b>
35811	O	juv. ♂	16.7.54	Slimbridge : 51°47'N. 2°28'W. (Gloucestershire)
	[?]		17.8.56	Bor : 56°24'N. 44°07'E. (Gorki) <b>U.S.S.R.</b>

In addition to the above, 84 birds ringed in the British Isles between August and March were recovered abroad as follows :

TABLE A—COUNTRY AND MONTH OF RECOVERY OF MALLARD (*Anas platyrhynchos*)

Country of recovery	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Total
France ...	...			1	1	3	1	2		2	6	16
Holland & Belgium ...	...	1	1	2	5	4	3	3	1	2	2	24*
Denmark ...	...				3		2	1				6
Germany & Poland ...	...				4	2	2	1	1	1		11
Sweden & Finland ...	...	1			8	6						15
U.S.S.R.† ...	...		1		8	2	1					12

\* excludes one bird reported as "October/November" but includes one bird recovered in two different months.

† including the Baltic states.

NOTE.—The above table and other similar tables in the report are subject to error in cases where the date of recovery has been assumed to be approximately that of the report, and where the bird may have been found several weeks after it died.

Of over 250 Mallard recovered in the British Isles only 29 show movement of more than 50 miles and only one from Great Britain was recovered in Ireland.

**Teal (*Anas crecca*)**

92796	ad. ♂	5.10.54	Piaam : 53°02'N. 5°24'E. (Friesland) <b>Holland</b>
17350	v	26.1.55	Abberton : 51°50'N. 0°53'E. (Essex)
	+	10.2.56	Nr. Grosseto : 42°46'N. 11°08'E. (Toscana) <b>Italy</b>
17365	ad. ♂	29.1.55	Abberton
	+	15.1.56	Nr. Venice : 45°26'N. 12°20'E. <b>Italy</b>
17588	ad. ♂	31.3.55	Abberton
	+	0.12.56	Nr. Dimitrovgrad : 42°03'N. 25°34'E. (Khaskovo) <b>Bulgaria</b>

This is the first recovery of any species from Bulgaria.



Recovery localities of Teal ringed at Abberton, and reported in Britain in 1956 at distances of 100 miles or more, are shown on Map 1.



MAP 1—RECOVERIES OF TEAL (*Anas crecca*) RINGED AT ABBERTON, ESSEX:  
SEPTEMBER-MARCH

Recoveries in the same winter are indicated by circles ; those in subsequent winters by dots. Recoveries showing movement of less than 100 miles (those within the radius of the broken line) are omitted.

3008337	1stW. ♂	9.1.56	Abberton											
	[?]	27.12.56	At sea, N.E. of <b>Faeroes</b>	ca. 63°00'N. 4°0'W.										
912559	f.g. ♀	12.1.52	Nr. Peterborough :	52°38'N. 0°17'W. (Northamptonshire)										
232434	v	28.3.55	Nr. Rotterdam :	51°54'N. 4°39'E. ( <b>Zuid-Holland</b> )										
	+	ca.10.3.56	Nr. Paimboeuf :	47°16'N. 2°03'W. (Loire Atlantique) <b>France</b>										

In addition to the foregoing recoveries 283 Teal were reported from abroad, as summarized in Table B.

TABLE B—COUNTRY AND MONTH OF RECOVERY OF TEAL (*Anas crecca*)

Country of recovery	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
Iberia ...	...									1	7	1	9
France ...	...				1	2		1	9	15	85	7	121*
Holland & Belgium		1			2	5	6	3	3	5	2	1	29*
Denmark ...	...				8	13	1		1				23
Germany & Poland	1				4	3	3	4		1			16
Norway & Sweden		3			7	5	1						17*
Finland ...	...	8			5	1							14
U.S.S.R. & Baltic States	...	3	6	1	19	18	3	1			1		54*

\* Recoveries marked "autumn" (one French bird marked "winter") are omitted from the monthly columns but included under "Total."

NOTE.—The large number of recoveries in France in February coincided with a sharp cold spell, although the movement was not so clearly defined as in February, 1954 (see *antea* vol. xlviii, p. 475). In 1955 when there was no severe cold spell in western Europe, only 35 Teal were recovered in France.

Some of the recoveries from the U.S.S.R. listed in the Table relate to years prior to 1956. See also footnote to Table A.

Gadwall (*Anas strepera*)

908518	ad. ♀	14.4.50	Abberton :	51°50'N. 0°53'E. (Essex)									
	v	11.3.52	ibid										
	v	19.5.52	ibid										
	v	22.5.54	ibid										
	+	(18.1.56)	Nr. Weymouth (Dorset)	170m. S.W.									
939059	1stW ♀	18.8.54	Slimbridge :	51°47'N. 2°28'W. (Gloucestershire)									
	+	Oct./Nov. 1956	Fiélouse :	43°32'N. 4°38'E. (Bouches-du-Rhône) <b>France</b>									
938904	f.g. ♀	14.3.56	Slimbridge										
	[?]	1.8.56	Nr. Paslek :	ca. 54°02'N. 19°27'E. (Olsztyn) <b>Poland</b>									

Wigeon (*Anas penelope*)TABLE C—COUNTRY AND MONTH OF RECOVERY OF WIGEON (*Anas penelope*)

Country of recovery	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
France ...	...										4		4
England & Wales								1	3	5	8	1	18
Holland ...	...	1				1							2
Germany...	...						1				1		2
Denmark ...	...						3						3
Sweden ...	...				1								1
Finland ...	...					1							1
U.S.S.R. ...	...	10	2		1	5	1						19

See footnote to Table A.

917514 1stW. ♀ 15.2.55 Abberton : 51°50'N. 0°53'E. (Essex)  
 [?/] mid. 6.55 Nr. Potapovo : 68°45'N. 86°19'E. (Taimyr) **U.S.S.R.**

This is the most easterly recovery ever recorded by the scheme. Including the above, 50 recoveries of Wigeon were reported during the year, 42 of them relating to birds ringed at Abberton. They are summarized in Table C.

### Pintail (*Anas acuta*)

932755 1stW. ♀ 2.3.53 Abberton : 51°50'N. 0°53'E. (Essex)  
 + 23.12.56 Neston (Cheshire) 190m. N.W.  
 915321 f.g. ♂ 29.12.53 Slimbridge : 51°47'N. 2°28'W. (Gloucestershire)  
 [?/] 12.8.56 Solotcha : 54°48'N. 39°54'E. (Ryazan) **U.S.S.R.**  
 939940 1stW. ♂ 31.10.55 Slimbridge  
 [?/] 29.5.56 Salekhard : 66°35'N. 66°40'E. (Tumen) **U.S.S.R.**  
 916714 f.g. 30.1.54 Abbotsbury : 50°40'N. 2°36'W. (Dorset)  
 () 12.2.56 Longeville : 46°26'N. 1°29'W. (Vendée) **France**  
 925358 f.g. ♀ 24.1.40 Abbotsbury  
 [?/] 6.9.56 Kurlovski : 55°27'N. 40°37'E. (Vladimir) **U.S.S.R.**

### Shoveler (*Spatula clypeata*)

AH2268 O pull. 26.6.55 Gladhouse Reservoir : 55°46'N. 3°08'W. (Midlothian)  
 Sm&W  
 () 15.12.56 Guadalquivir Estuary : ca. 37°05'N. 6°10'W. (Sevilla)  
**Spain**  
 915382 f.g. ♂ 20.9.54 Nr. Peterborough : 52°38'N. 0°17'W. (Northampton-  
 shire)  
 + 0.2.56 Nr. Le Havre : 49°26'N. 0°09'E. (Seine-Maritime)  
**France**  
 916558 f.g. ♀ 19.9.54 Nr. Peterborough  
 + 15.2.56 Étang Fournelet : ca. 43°30'N. 4°37'E., Camargue  
 (Bouches-du-Rhône) **France**  
 915387 f.g. ♂ 20.9.54 Nr. Peterborough  
 + 28.3.56 Nr. Abbeville : 50°06'N. 1°51'E. (Somme) **France**  
 918787 f.g. ♂ 3.12.55 Nr. Peterborough  
 + 28.1.56 Nr. Haverfordwest (Pembrokeshire) 210m. W.S.W.  
 3003797 1stW. ♀ 29.12.55 Abberton : 51°50'N. 0°53'E. (Essex)  
 + ca.3.2.56 Nr. Le Havre : 49°30'N. 0°06'E. (Seine-Maritime)  
**France**  
 932893 ad. ♀ 22.12.55 Abberton  
 + 0.2.56 Couëron : 47°14'N. 1°42'W. (Loire-Atlantique) **France**  
 914160 ad. ♂ 19.11.52 Slimbridge : 51°47'N. 2°28'W. (Gloucestershire)  
 × (7.5.56) Pembroke Dock (Pembrokeshire) 105m. W.  
 919188 ad. ♀ 7.1.56 Slimbridge  
 + 9.1.56 Nr. Montreuil-sur-Mer : 50°28'N. 1°46'E. (Pas-de-  
 Calais) **France**  
 919112 1stW. ♂ 24.12.55 Slimbridge  
 [?/] 24.8.56 Spas-Klepiki : 55°09'N. 40°11'E. (Ryazan) **U.S.S.R.**  
 909646 ad. ♂ 14.12.50 Slimbridge  
 [?/] 29.8.56 Murom : 55°32'N. 42°02'E. (Vladimir) **U.S.S.R.**  
 3007152 f.g. ♂ 2.8.56 Slimbridge  
 + 20.8.56 Leeuwen : 51°53'N. 5°32'E. (Gelderland) **Holland**  
 919180 f.g. ♂ 21.12.55 Slimbridge  
 + 11.2.56 Nr. Pellerin : 47°12'N. 1°45'W. (Loire-Atlantique)  
**France**



**Tufted Duck (*Aythya fuligula*)**

908469	ad. ♂	2.4.50 12.2.56	Abberton : 51°50'N. 0°53'E. (Essex) Nr. Mikha-Tskhakaya : 42°13'N. 42°00'E. (Georgia) <b>U.S.S.R.</b>
932903	1stW. ♀	1.1.56 3.7.56	Abberton Kirillov : 59°50'N. 38°21'E. (Vologda) <b>U.S.S.R.</b>
932858	1stW. ♀	23.1.55 20.5.55	Abberton Pechora : 65°05'N. 57°18'E. (Komi) <b>U.S.S.R.</b>
932833	ad. ♂	22.3.54 25.8.55	Abberton Nr. Naryan-Mar : 67°40'N. 53°00'E. (Archangel) <b>U.S.S.R.</b>
932868	1stW. ♀	28.2.55 15.11.56	Abberton Nr. Gamleby : 57°54'N. 16°24'E. Västervik (Kalmar) <b>Sweden</b>
932821	ad. ♀	14.2.54 28.9.56	Abberton Nr. Skellefteå : 64°40'N. 21°12'E. (Västerbotten) <b>Sweden</b>
93008649	1stW. ♀	3.3.56 1.10.56	Abberton Lindöja : 58°33'N. 16°57'E. (Ostergötland) <b>Sweden</b>
Orielton 4578	ad.	31.1.47 15.2.56	Orielton : 51°40'N. 4°57'W. (Pembrokeshire) Nr. Isigny : 49°18'N. 1°06'W. (Calvados) <b>France</b>

**Pochard (*Aythya ferina*)**

932786	f.g. ♂	13.9.53 20.1.56	Abberton : 51°50'N. 0°53'E. (Essex) North Slob (Wexford) 305m. W.
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**Grey Lag Goose (*Anser anser*)**

143446	ad.	22.11.53 20.1.56	Dumfriesshire Nr. Ramsgrange (Wexford) ca. 250m. S.W.
143476	1stW.	22.11.53 ca.1.5.56	Dumfriesshire Skridufell: 64°07'N. 19°58'W. Thjórsárdalur, S. Iceland
142789	ad.	21.11.52 20.4.54	Montrose : 56°42'N. 2°28'W. (Angus) Eyjafjörður, ca. 66°00'N. 18°30'W. N. Iceland

**White-fronted Goose (*Anser albifrons*)**

127395	ad. ♀	15.2.53 5.6.55	Slimbridge : 51°47'N. 2°28'W. (Gloucestershire) Kolguev Island : 69°00'N. 49°00'E. Barents Sea, <b>U.S.S.R.</b>
129384	ad.	27.2.50 1954	Slimbridge Kolguev Island, <b>U.S.S.R.</b>
130050	ad.	27.2.51 1954	Slimbridge Kolguev Island, <b>U.S.S.R.</b>
130064	ad.	25.2.51 2.1.56	Slimbridge Nr. Oudega : 53°06'N. 5°57'E. (Friesland) <b>Holland</b>
SWT192	1stW. ♂	15.2.53 0.1.56	Slimbridge Knokke-Zoute : 51°21'N. 3°19'E. (West Flanders) <b>Belgium</b>
127398	ad. ♀	17.2.53 2.3.56	Slimbridge St. Pierre du Jonquet : 49°11'N. 0°09'W. (Calvados) <b>France</b>

130606	1stW. ♂	15.2.53	Slimbridge
+		11.2.56	Nr. Le Crotoy : 50°13'N. 1°38'E. (Somme) <b>France</b>
127369	1stW. ♀	15.2.53	Slimbridge
+		23.2.56	Rue : 50°16'N. 1°40'E. (Somme) <b>France</b>
SWT12	ad.	22.2.52	Slimbridge
+		23.2.56	(Calvados) <b>France</b>

**Pink-footed Goose** (*Anser arvensis brachyrhynchus*)

147075	ad.	10.10.55	Forteviot : 56°20'N. 3°32'W. (Perthshire)
+		3.6.56	Scoresby Sound : 70°20'N. 22°00'W., N.E. <b>Greenland</b>
147255	ad.	10.10.55	Forteviot
+		end 4.56	Vadbrekka : 65°05'N. 15°32'W., Hrafnkelsdalur (North Múla Sysla) E. <b>Iceland</b>
146332	ad. ♀	26.11.54	Crieff : 56°22'N. 3°51'W. (Perthshire)
×		30.6.56	Lambafell : 64°31'N. 19°46'W. Central <b>Iceland</b>
141295	ad. ♀	26.10.54	Nr. Annan : 54°59'N. 3°16'W. (Dumfriesshire)
+		7.8.56	South Jamesonland : ca. 71°00'N. 23°00'W. N.E. <b>Greenland</b>
141427	ad.	26.10.54	Nr. Annan
/?/		17.5.56	Fair Isle (Shetland) 320m. N.N.E.
142683	ad.	19.11.52	Midlothian
v		25.5.55	Maelifellsdalur : ca. 65°24'N. 19°25'W. Skagafjörður, N. <b>Iceland</b>

**Mute Swan** (*Cygnus olor*)

YBo62	1stW.	3.3.56	Abberton : 51°50'N. 0°53'E. (Essex)
×		30.5.56	Earlith, nr. St. Ives (Huntingdonshire) 49m. N.W.

**Buzzard** (*Buteo buteo*)

AE2384	O	pull.	9.6.54	Handa Island : 58°22'N. 5°13'W. (Sutherland) IDP
+			12.4.56	Strathcroy, nr. Stoer (Sutherland) 12m. S.S.W.
AF3900	O	pull.	16.6.56	Capel Curig : 53°06'N. 3°55'W. (Caernarvonshire) RAFK
()			ca.5.11.56	St. Asaph (Flintshire) 22m. E.N.E.

**Sparrowhawk** (*Accipiter nisus*)

382149	f.g. ♀	9.11.55	Fair Isle : 59°32'N. 1°37'W. (Shetland)
+		3.4.56	Heligoland : 54°09'N. 7°52'E. <b>Germany</b>
382139	1stW. ♀	5.10.55	Fair Isle
+		18.1.56	Farnell, nr. Brechin (Angus) 200m. S.

**Hen Harrier** (*Circus cyaneus*)

3001569	O	pull.	11.7.55	Orkney : 59°07'N. 3°19'W. EB
×		(long dead)	7.5.56	Nr. Thornhill (Dumfriesshire) 270m. S.

**Montagu's Harrier** (*Circus pygargus*)

3011953	O	pull.	15.7.56	Nr. Hamsterley : 54°41'N. 1°49'W. (Durham) ND&N
×			ca.10.9.56	Bouzy : 49°04'N. 4°08'E. (Marne) <b>France</b>

**Merlin** (*Falco columbarius*)

385074	1stW. ♂	28.8.56	Fair Isle : 59°32'N. 1°37'W. (Shetland)
+		(20.10.56)	Halen : 50°57'N. 5°07'E. (Limburg) <b>Belgium</b>
376042	O	pull.	21.7.53
×		28.5.56	Edmondbyers : 54°51'N. 1°55'W. (Durham) A&R
			Cold Fell, <i>nr.</i> Brampton (Cumberland) 25m. W.
375039	O	pull.	26.6.56
+		19.9.56	Nr. Hamsterley : 54°41'N. 1°49'W. (Durham) ND&N
			Crossgill, <i>nr.</i> Garrigill (Cumberland) 22m. W.S.W.

**Kestrel** (*Falco tinnunculus*)

33005915	O	pull.	17.7.56	Pannal : 53°57'N. 1°32'W. <i>nr.</i> Harrogate (Yorkshire) Sa&W
	×		25.11.56	Ingleby, <i>nr.</i> Sturton-by-Stow (Lincolnshire) 57m. S.E.
3374007		ad.	21.8.55	Dungeness : 50°55'N. 0°59'E. (Kent)
	+		4.12.55	Saint Angeau : 45°50'N. 0°18'E. (Charente) <b>France</b>

**Water Rail** (*Rallus aquaticus*)

285327		ad.	22.2.55	Abberton : 51°50'N. 0°53'E. (Essex)
	×		end 7.56	<i>Nr.</i> Västervick : 57°45'N. 16°40'E. (Kalmar) <b>Sweden</b>

The first recovery of this species in Sweden.

**Moorhen** (*Gallinula chloropus*)

AF1725		ad.	30.1.53	Duddingston Loch : 55°56'N. 3°09'W. (Midlothian) DRA
	+		(16.2.56)	East Learmouth, Cornhill (Northumberland) 40m. E.S.E.

**Coot** (*Fulica atra*)

AF6710		ad.	11.6.53	Abberton : 51°50'N. 0°53'E. (Essex)
	+		2.3.56	Noyelles-sur-Mer : 50°11'N. 1°43'E. (Somme) <b>France</b>
AF9455		ad.	24.2.54	Abberton
	+		5.2.56	Longpre-les-Corps-Saints : 50°01'N. 1°59'E. (Somme) <b>France</b>
AF9580		ad.	19.1.55	Abberton
	+		ca.1.3.56	<i>Nr.</i> Isigny : 49°18'N. 1°02'W. (Calvados) <b>France</b>
AF9592		ad.	25.1.55	Abberton
	+		(6.2.56)	<i>Nr.</i> Le Breuil-en-Auge : 49°13'N. 0°14'E. (Calvados) <b>France</b>
AF9594		ad.	25.1.55	Abberton
	×		ca.19.2.56	Lombardsijde : 51°09'N. 2°46'E. (West Flanders) <b>Belgium</b>
AH4509		ad.	1.2.56	Abberton
	×		13.2.56	Bodegraven : 52°05'N. 4°45'E. (Z-Holland)
AF9491		ad.	7.3.54	Abberton
	+		20.2.56	Kappeln : 54°39'N. 9°56'E. (Schleswig-Holstein) <b>Germany</b>
AF9598		ad.	26.1.55	Abberton
	×		24.4.56	<i>Nr.</i> Lubeck : 54°00'N. 10°54'E. (Schleswig-Holstein) <b>Germany</b>
AH3764		ad.	18.2.55	Abberton
	+		25.8.56	Hieve, <i>nr.</i> Emden : 53°22'N. 7°13'E. (Niedersachsen) <b>Germany</b>

**Oystercatcher** (*Haematopus ostralegus*)

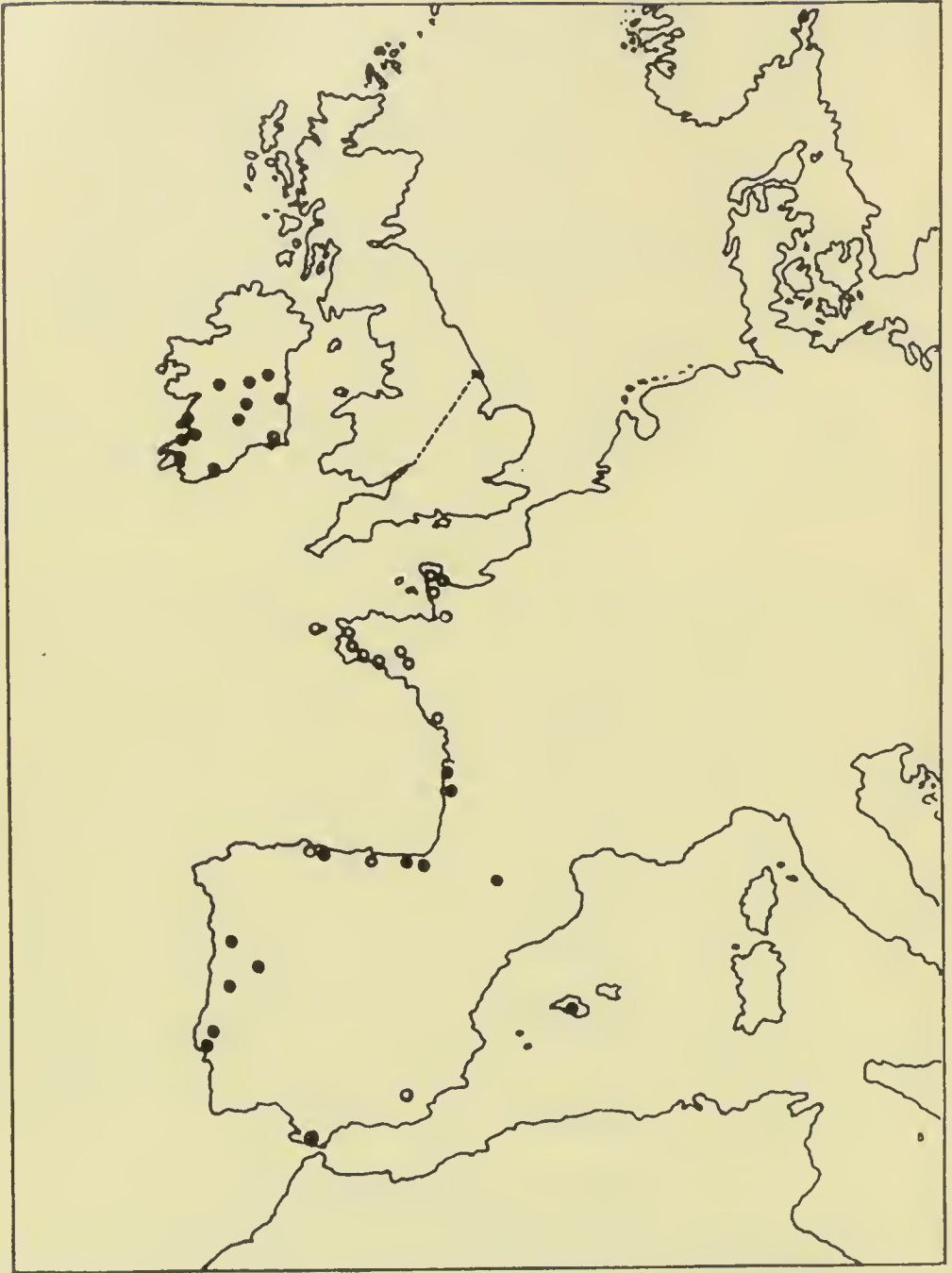
382213	O	pull.	7.6.55	Fair Isle : 59°32'N. 1°37'W. (Shetland)
	×		26.4.56	Swansea (Glamorgan) 560m. S.S.W.
374751	O	pull.	22.5.55	Aberlour : 57°28'N. 3°14'W. (Banffshire) RP
	×		13.1.56	Dungarvan (Waterford) 410m. S.S.W.
339053	O	pull.	2.6.53	Skokholm : 51°42'N. 5°16'W. (Pembrokeshire)
	+		2.1.55	<i>Nr.</i> Fouessnant : 47°53'N. 4°00'W. (Finistère) <b>France</b>

**Lapwing** (*Vanellus vanellus*)

271424	O	pull.	18.6.55	Ingbirchworth : 53°33'N. 1°40'W. (Yorkshire) JCSE
	()		12.2.56	Campos : 39°26'N. 3°04'E. <b>Majorca</b>

This is the first recovery from the Balearic Islands.





MAP 2—WINTER RECOVERIES OF LAPWINGS (*Vanellus vanellus*)  
RINGED IN BRITAIN

Recoveries of birds ringed in northern and western Britain are indicated by dots ; those ringed in the south and east by circles (the broken line shows the division of Britain adopted).

**Ringed Plover (*Charadrius hiaticula*)**

S12806	O	pull.	16.6.55	Monifieth : 56°29'N. 2°49'W. (Angus) GBC
	+		22.10.56	Laytown (Meath) 220m. S.W.

527005	1stW.	8.9.55	Nr. Seahouses : 55°35'N. 1°39'W. (Northumberland) MHBO
+		29.4.56	Bassin d'Arcachon : 44°43'N. 1°10'W. (Gironde) <b>France</b>
549343	O pull.	20.7.56	Nr. Redcar : 54°37'N. 1°04'W. (Yorkshire) PAR
+		19.9.56	le Croisic : 47°18'N. 2°31'W. (Loire-Atlantique) <b>France</b>

### Little Ringed Plover (*Charadrius dubius*)

62228	O pull.	25.6.55	" S. Lincolnshire "
×		6.10.56	Nr. Kettering (Northamptonshire) 24m. S.W.

### Turnstone (*Arenaria interpres*)

96273	f.g.	27.10.54	Isle of May : 56°11'N. 2°33'W. (Fife)
v		1.6.56	Daneborg : ca. 74°15'N. 20°00'W. Young Sound, <b>Greenland</b>

### Snipe (*Capella gallinago*)

64499	ad.	3.4.54	Abberton : 51°50'N. 0°53'E. (Essex)
/?/		0.2.56	Carentan : 49°18'N. 1°14'W. (Manche) <b>France</b>
33605	ad.	1.10.55	Abberton
+		20.2.56	Nr. St. Gildas des Bois : 47°32'N. 1°57'W. (Loire-Atlantique) <b>France</b>
11392	ad.	11.8.55	Abberton
+		12.2.56	Nr. La Baule : 47°18'N. 2°23'W. (Loire-Atlantique) <b>France</b>
34179	ad.	1.1.56	Abberton
+		2.2.56	Nr. Mezidon : 49°04'N. 0°03'W. (Calvados) <b>France</b>
24480	ad.	24.4.53	Abberton
+		12.12.56	Assérac : 47°26'N. 2°23'W. (Loire-Atlantique) <b>France</b>
84960	ad. ♂	6.9.54	Abberton
+		1.12.56	Jordanstown, Belfast (Antrim) 340m. N.W.
24257	ad.	19.9.52	Abberton
+		1.9.56	Hammarsjön : 56°00'N. 14°14'E. (Kristianstad) <b>Sweden</b>

This is the first Snipe to be recovered in Sweden.

### Woodcock (*Scolopax rusticola*)

85080	ad.	28.10.56	Fair Isle : 59°32'N. 1°37'W. (Shetland)
+		12.11.56	Nr. Strathdon (Aberdeenshire) 170m. S.S.W.
58884	f.g.	27.3.56	Isle of May : 56°11'N. 2°33'W. (Fife)
×		15.11.56	Nr. Montreuil : 50°28'N. 1°46'E. (Pas-de-Calais) <b>France</b>

### Curlew (*Numenius arquata*)

74724	O pull.	26.6.55	Nr. Newtonmore : 57°04'N. 4°07'W. (Inverness-shire) RP
×	(long dead)	9.4.56	Nr. Port Ellen, Islay (Argyllshire) 125m. S.W.
20994	O pull.	25.6.51	Glen Clova : ca. 56°51'N. 3°06'W. (Angus) DRA
+		15.1.56	Nr. Drogheda (Meath) 250m. S.W.
005047	O pull.	1.6.56	Nr. Wooler : 55°33'N. 2°01'W. (Northumberland) MHBO
+		(20.9.56)	Nr. Thurles (Tipperary) 305m. S.W.
12468	O pull.	24.5.49	Sedbergh : 54°19'N. 2°32'W. (Yorkshire) SS
+		29.10.56	Malltraeth Bay (Anglesey) 107m. S.W.
77674	O pull.	21.7.54	Harrogate : 53°59'N. 1°33'W. (Yorkshire) Sa&W
×		8.2.56	Nr. Padstow (Cornwall) 280m. S.S.W.

**Common Sandpiper** (*Tringa hypoleucos*)

- X<sub>42029</sub> O pull. 27.6.54 Gladhouse Reservoir : 55°46'N. 3°08'W. (Midlothian)  
Sm&W  
× 8.5.56 Torduff Reservoir (Midlothian) 10m. N.W.

**Redshank** (*Tringa totanus*)

- W<sub>25032</sub> O pull. 29.5.55 Gladhouse Reservoir : 55°46'N. 3°08'W. (Midlothian)  
Sm&W  
× 19.2.56 Nr. Milford Haven (Pembrokeshire) 290m. S.S.W.

**Little Stint** (*Calidris minuta*)

- KR8?? ad. 9.10.52 or Abberton : 51°50'N. 0°53'E. (Essex)  
15.9.52  
+ 23.9.56 Nr. Lisbon : 38°50'N. 9°05'W. **Portugal**

The first recovery of a Little Stint.

**Dunlin** (*Calidris alpina*)

- S<sub>42668</sub> + ad. 13.8.56 Nr. Seahouses : 55°35'N. 1°39'W. (Northumberland) MHBO  
27.9.56 Nr. la Tremblade : ca. 45°48'N. 1°08'W. (Charente-Maritime)  
**France**

**Ruff** (*Philomachus pugnax*)

- S<sub>79004</sub> ad. ♂ 11.8.56 Abberton : 51°50'N. 0°53'E. (Essex)  
× 7.10.56 Methley, nr. Castleford (Yorkshire) 165m. N.W.

The first recovery of a Ruff.

**Arctic Skua** (*Stercorarius parasiticus*)

- AT<sub>19917</sub> O pull. 14.7.56 Fair Isle : 59°32'N. 1°37'W. (Shetland)  
× 26.8.56 La Caridad : 43°34'N. 6°52'W. (Asturias) **Spain**  
AT<sub>19919</sub> O pull. 14.7.56 Fair Isle  
× 19.9.56 Koksijde : 51°06'N. 2°39'E. (West Flanders) **Belgium**  
AT<sub>22624</sub> O pull. 21.7.56 Fair Isle  
× ca.9.11.56 Nr. Kolding : 55°38'N. 9°18'E. (Jutland) **Denmark**  
AT<sub>22629</sub>& YD<sub>0010</sub> O pull. 22.7.56 Fair Isle  
v 26.10.56 Nr. Vila Real de Santo António : 37°12'N. 7°25'W.  
(Algarve) **Portugal**

**Great Black-backed Gull** (*Larus marinus*)

- 407982 O pull. 3.7.51 Nr. Malltraeth : ca. 53°11'N. 4°23'W. (Anglesey) T&H  
× (28.3.56) Cockerham, nr. Garstang (Lancashire) 85m. N.E.  
411143 O pull. 10.7.55 Inishvickillane : 52°03'N. 10°36'W. Basket Islands (Kerry)  
DFC  
× 19.2.56 Armen lighthouse : 48°03'N. 5°00'W. (off Finistère) **France**  
408209 O pull. 5.7.55 Grassholm : 51°44'N. 5°29'W. (Pembrokeshire) DBI  
× 28.8.56 Weston-super-Mare (Somerset) 117m. E.S.E.

**Lesser Black-backed Gull** (*Larus fuscus*)

- AH<sub>7654</sub> O pull. 26.8.56 Farne Islands : 55°37'N. 1°37'W. (Northumberland)  
ND&N  
+ 16.11.56 Nr. Siracusa : 37°04'N. 15°18'E. **Sicily**  
AD<sub>8270</sub> O pull. 19.7.51 Skokholm : 51°42'N. 5°16'W. (Pembrokeshire)  
+ 12.9.56 Nr. Middlefart : 55°30'N. 9°44'E. (lyn) **Denmark**

Both the above recoveries are from areas where the British race *Larus fuscus graellsii* is only a casual visitor. A further 23 recoveries abroad are summarized in Table D.



TABLE D—COUNTRY AND MONTH OF RECOVERY OF LESSER BLACK-BACKED GULL (*Larus fuscus*)

Country of recovery.				Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
France	...	...	...			1	1		1		1	4
Portugal & West Spain	...			2		3	6	3			2	17*
Morocco	...	...	...					2				2

\* includes one in N. Spain reported as "spring."  
See footnote to Table A.

Herring Gull (*Larus argentatus*)

403944	O	pull.	10.7.52	Steepholm : 51°21'N. 3°07'W. (Somerset) RHP
	×		3.6.56	East Ardsley, Wakefield (Yorkshire) 180m. N.N.E.
940728		1stW.	10.3.56	Steepholm ST
	×		(10.4.56)	Courtown Harbour, Gorey (Wexford) 160m. N.W.

Common Gull (*Larus canus*)

358122	O	pull.	9.6.53	Nr. Inverness : 57°28'N. 4° 13'W. ECMK
	×		23.2.56	Nr. Rostrevor (Down) 250m. S.S.W.
931819		f.g.	11.12.52	Deeping St. James : 52°40'N. 0°17'W. (Lincolnshire) DD
	+		30.7.56	Nr. Balsfjord : 69°10'N. 19°03'E. (Troms) <b>Norway</b>
393129		adult	18.2.56	Dungeness : 50°55'N. 0°59'E. (Kent)
	×		(24.2.56)	Pourville : 49°55'N. 1°02'E. (Seine Maritime) <b>France</b>

Black-headed Gull (*Larus ridibundus*)

So many ringing localities are involved in the 172 recoveries that simple summarization in table form is not practicable. All recoveries showing movement of 100 miles or more, and all foreign recoveries are therefore given in full.

366762	O	pull.	16.6.52	Nr. Leuchars : 56°22'N. 2°53'W. (Fife) WJE
	/?		(27.12.56)	Mageney (Kildare) 290m. S.W.
3014632	O	pull.	3.7.56	Nr. Leuchars IVBP
	×		(14.11.56)	Nr. Ballardle, Kilkeel (Down) 200m. S.W.
376637	O	pull.	13.6.53	Copeland : 54°40'N. 5°32'W. (Down) JAB
	×		7.9.56	Nevin (Caernarvonshire) 125m. S.S.E.
373550	O	pull.	17.6.56	Ravenglass : 54°21' N.3°25'W. (Cumberland) RMB
	v		10.10.56	Crossmolina (Mayo) 240m. W.
337407	O	pull.	8.7.50	Ravenglass. JEC
	×		(21.7.56)	Birness, Ellon (Aberdeenshire) 220m. N.N.E.
374348	O	pull.	28.7.54	Nottingham : 52°57'N. 1°08'W. HB
	×		25.3.56	Nr. Portsmouth (Hampshire) 145m. S.
3001109	O	pull.	11.6.55	Alderfen Broad : 52°42'N. 1°33'E. (Norfolk) HE&W
	×		(28.9.56)	Waberthwaite (Cumberland) 230m. N.W.
387758	O	pull.	25.6.54	Nr. Rhulen : 52°09'N. 3°16'W. (Radnorshire) PJC
	×		10.11.56	Gt. Eccleston (Lancashire) 120m. N.N.E.
387602	O	pull.	22.6.54	Rhosgoch : 52°07'N. 3°11'W. (Radnorshire) PJC
	×	ca.	1.3.56	Barrowford (Lancashire) 125m. N.N.E.
355396	O	pull.	21.6.53	Rhosgoch PJC
	×		(30.10.56)	Nr. Eccles (Lancashire) 100m. N.N.E.
364216	O	pull.	17.6.56	Rhosgoch. SMDA
	×		(10.9.56)	Maidstone (Kent) 160m. E.S.E.

373144	O	pull.	22.6.54	Rhosgoch. PJC
	×		10.6.56	Nr. Garstang (Lancashire) 130m. N.N.E.
383883	O	pull.	13.6.54	Horsey I. : 51°51'N. 1°16'E. (Essex) PSB
	×		ca.7.3.56	Guisseny : 48°38'N. 4°24'W. (Finistère) <b>France</b>
388898	O	pull.	13.6.54	Horsey I. PSB
	×		13.6.56	Earby (Yorkshire) 200m. N.W.
391146	O	pull.	13.7.54	Nr. Brightlingsea : 51°49'N. 1°02'E. (Essex) RWA
	×		ca.29.2.56	Hamble (Hampshire) 115m. W.S.W.
391427	O	pull.	30.6.55	Nr. Brightlingsea. RWA
	×		15.2.56	Pointedu Hoc : 49°26'N. 0°09'E. (Seine Maritime) <b>France</b>
3004128	O	pull.	30.6.55	Nr. Brightlingsea. RWA
	×		22.2.56	Lanvéoc : 48°17'N. 4°28'W. (Finistère) <b>France</b>
360874		ad.	28.2.52	St. James's Park : 51°30'N. 0°08'W. London. LNHS
	v		17.4.55	Wroclaw : 51°07'N. 17°00'E. <b>Poland</b>
3013308	O	pull.	16.6.56	Stoke : 51°27'N. 0°38'E. (Kent) F&M
	×		7.9.56	Harptree (Somerset) 140m. W.
3013426	O	pull.	17.6.56	Stoke. F&M
	v		30.7.56	New Malden (Surrey) 37m. W.
	×		28.12.56	Séné : 47°38'N. 2°43'W. (Morbihan) <b>France</b>
3013537	O	pull.	20.6.56	Stoke. F&M
	×		28.8.56	Bitton, Bristol (Gloucestershire) 130m. W.
383201		1stW.	11.2.56	Sandwich : 51°17'N. 1°20'E. (Kent) DFH
	×		ca.15.8.56	The Hague : 52°05'N. 4°16'E. <b>Holland</b>

### Kittiwake (*Rissa tridactyla*)

All recoveries showing movement of 100 miles or more are given.

AT36358	O	pull.	24.7.56	Dunbar : 56°00'N. 2°31'W. (East Lothian) C&W
	+		4.11.56	<b>Bay of Biscay</b> : 45°51'N. 3°44'W.
375569	O	pull.	16.7.53	Farne Islands : 55°37'N. 1°37'W. (Northumberland) ND&N
	+		4.11.56	Kalø Vig : ca. 56°15'N. 10°25'E. (Jutland) <b>Denmark</b>
375629	O	pull.	7.7.54	Farne Islands. ND&N
	()		13.3.56	Off Blaavand : ca. 55°25'N. 7°30'E. (Jutland) <b>Denmark</b>
3004843	O	pull.	18.7.55	Farne Islands. ND&N
	×		15.2.56	Off Whitehaven (Cumberland) 120m. S.W.
3012482	O	pull.	27.6.56	Farne Islands. ND&N
	+		12.10.56	Off Heligoland : ca. 54°09'N. 7°52'E. <b>Germany</b>
AT42813		ad.	3.7.56	Farne Islands. ND&N
	()		ca.7.11.56	Off Hållö : 58°21'N. 11°16'E. Smögen (Bohus) <b>Sweden</b>
AT42887		ad.	3.7.56	Farne Islands. ND&N
	×		16.11.56	Skagen : 57°44'N. 10°37'E. (Jutland) <b>Denmark</b>
3017529	O	pull.	7.7.56	Farne Islands. ND&N
	+		22.8.56	Sjaellands Odde : 55°58'N. 11°20'E. <b>Denmark</b>
3012447	O	pull.	22.7.56	Farne Islands. ND&N
	×		2.9.56	Minsmere (Suffolk) 260m. S.E.
AT27716		ad.	4.7.55	North Shields : 55°01'N. 1°26'W. (Northumberland) C&W
	×		9.1.56	Port Maitland : 44°00'N. 66°09'W. (Yarmouth) <b>Nova Scotia</b>
AT27750		ad.	29.7.55	North Shields. C&W
	×		(15.12.56)	Eastbourne (Sussex) 300m. S.S.E.

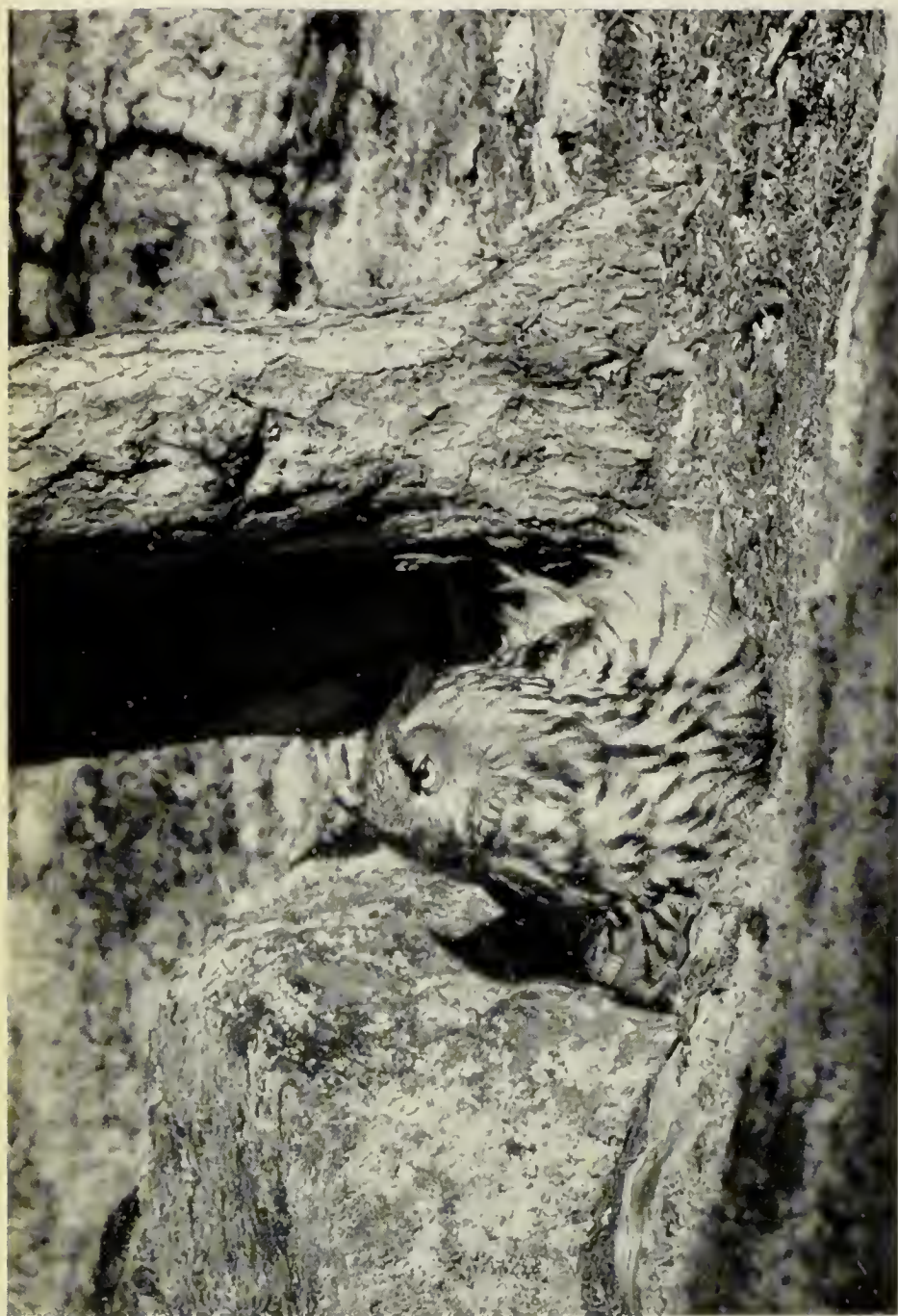


Kurt Ellström and Enar Sjöberg

FEMALE EAGLE OWL (*Bubo bubo*) ARRIVING AT NEST ROCK: HÄLSINGLAND, SWEDEN, 25<sup>TH</sup> MAY 1954  
 This was taken at 10.10 p.m., as the female landed at the nest, bringing her feet forward and braking with her wings. Though it is the largest of all European owls, weighing from  $4\frac{1}{2}$  to 7 lbs.—between  $1\frac{1}{2}$  and  $2\frac{1}{2}$  times as much as the average Buzzard (*Buteo buteo*)—it flies as softly and silently as the others do. Note here the heavy head, the broad wings, and the thickly feathered tarsus and toes. This shows a typical Swedish habitat—a rocky promontary in the extensive spruce forests (see page 487).







Kurt Ellström and Enar Sjöberg

FEMALE EAGLE OWL (*Bubo bubo*) ON NEST: HÄLSINGLAND, SWEDEN, 14TH MAY 1954

Here one can see this bird's beautifully patterned under-parts—tawny buff, boldly streaked on the breast, more narrowly so on the belly, each feather also marked with fine wavy bars (see page 488). The tree immediately on the right of the bird is that which shows on the extreme left of plate 65, so that the nest, a typical scrape in the lee of a boulder, is only a couple of yards from the edge of the crag. The bare scrape is usually on the ground, on a ledge or in a crevice, but sometimes in the old nest of a bird of prey.

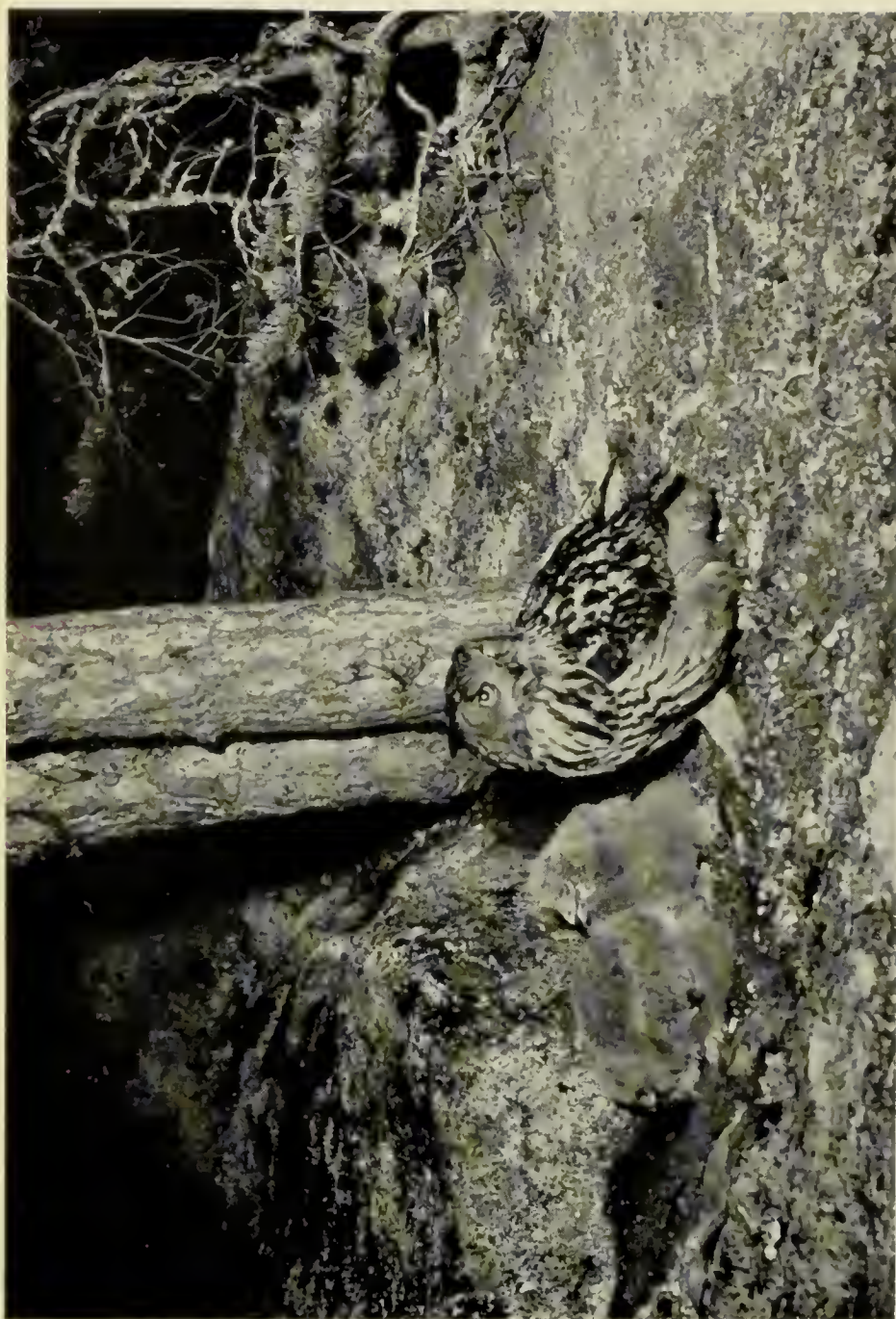




Kurt Ellström and Enar Sjöberg

FEMALE EAGLE OWL (*Bubo bubo*) BY NEST: HÄLSINGLAND, SWEDEN, 14TH MAY 1954  
 The wavy bars on the flank feathers show well here, as do the mottled black and tawny upper-parts. The facial disc is not complete in this species because the feathers over the eyes are normal and not radiating. The big ear-tufts are not raised in any of these plates, but are visible here and in plates 66 and 68. When they are raised, they and the dark line over each eye give the bird a fierce and frowning expression, but at other times it has quite a gentle, though almost catlike countenance. A white egg and a buffish-white youngster are visible on the left.





Kurt Ellström and Enar Sjöberg

FEMALE EAGLE OWL (*Bubo bubo*) AND YOUNG: HÄLSINGLAND, SWEDEN, 2ND JUNE 1954

Again note the mottled upper-parts, streaked breast, ear-tufts and feathered foot. The young are now over three weeks old—they leave the nest at about 5 weeks, but do not fly until later. Up to 6 eggs may be laid, but usually only three, and even then one of the chicks often dies. Eagle Owls have been known to kill animals ranging from Roe Deer (*Capreolus capreolus*) and Capercaillie (*Tetrao urogallus*) to voles and frogs, but in Sweden Brown Rats (*Rattus norvegicus*) form over half the prey, as they did at this nest (see page 488).



AT36707	O	pull.	22.6.56	North Shields. ND&N
	×		13.10.56	Templeuve : 50°38'N. 3°17'E. (Hainaut) <b>Belgium</b>
379123	O	pull.	20.7.55	Lundy : 51°12'N. 4°40'W. (Devon)
	×		2.7.56	Zonnemaire : 51°43'N. 3°57'E. (Zeeland) <b>Holland</b>

### Common Tern (*Sterna hirundo*)

S63800	O	pull.	6.7.56	Scolt Head : 52°59'N. 0°45'E. (Norfolk) EAD
	×		16.8.56	Bargstall : 54°14'N. 9°28'E. (Schleswig-Holstein) <b>Germany</b>
S65371	O	pull.	21.6.56	Stoke : 51°27'N. 0°38'E. (Kent) F&M
	×		29.8.56	Nr. List : 55°01'N. 8°26'E. Sylt <b>Germany</b>
W13537	O	pull.	2.7.56	Abbotsbury : 50°40'N. 2°36'W. (Dorset) FL
	×		15.8.56	Nr. Chaillevette : 45°44'N. 1°03'W. (Charente Maritime) <b>France</b>

### Arctic Tern (*Sterna macrura*)

S4632		ad.	14.7.52	Farne Islands : 55°37'N. 1°37'W. (Northumberland) ND&N
	×		17.8.56	Nr. Saksköbing : 54°48'N. 11°39'E. (Lolland) <b>Denmark</b>
X27013	O	pull.	19.7.53	Farne Islands. ND&N
	×		24.1.56	Lamberts Bay : 32°05'S. 18°19'E., Clanwilliam, <b>South Africa</b>

### Little Tern (*Sterna albifrons*)

X94159	O	ad.	5.6.54	St. Osyth : 51°49'N. 1°05'E. (Essex) RWA
	+		12.8.56	Esmoriz : 40°57'N. 8°38'W. (Beira Litoral) <b>Portugal</b>

### Sandwich Tern (*Sterna sandvicensis*)

276022	O	pull.	4.7.55	Farne Islands : 55°37'N. 1°37'W. (Northumberland) ND&N
	()		10.4.56	Vleesbaai : 34°11'S. 22°09'E. (Cape Province) <b>South Africa</b>
281268	O	pull.	16.7.54	Farne Islands. ND&N
	×		1.8.56	Kinnahult : 57°30'N. 12°45'E. (Älvsborg) <b>Sweden</b>

This is the first Sandwich Tern to be recovered in Sweden. There were 11 other birds reported from abroad : Portugal, 1 ; Morocco, 1 ; Senegal, 4 ; Ghana, 2 and Angola, 3, between the extreme dates 9th October and 14th April.

### Razorbill (*Alca torda*)

AT14378		ad.	25.6.55	Isle of May : 56°11'N. 2°33'W. (Fife)
	/ ? /		(7.2.56)	Nr. Les Pieux : 49°31'N. 1°51'W. (Manche) <b>France</b>
AT42664	O	pull.	24.6.56	Maughold Head : 54°18'N. 4°19'W. Isle of Man. CC&M
	+		21.10.56	Off Hendaye : 43°22'N. 1°46'W. (Basses Pyrénées) <b>France</b>
AT40027	O	pull.	24.6.56	Grassholm : 51°44'N. 5°29'W. (Pembrokeshire) SBO
	×		3.11.56	Nr. Penvénan : 48°48'N. 3°17'W. (Côtes-du-Nord) <b>France</b>
AT30468		ad.	26.5.55	Skokholm : 51°42'N. 5°16'W. (Pembrokeshire)
	×		25.1.56	Nr. Brest : 48°23'N. 4°30'W. (Finistère) <b>France</b>
AT40429	O	pull.	1.7.56	Skokholm
	()		6.10.56	Off Cabo Higuer : 43°24'N. 1°48'W. (Guipúzcoa) <b>Spain</b>
AT40399	O	pull.	3.7.56	Skokholm
	/ ? /		20.10.56	Pasajes : 43°20'N. 1.56'W. (Guipúzcoa) <b>Spain</b>
AT40516	O	pull.	4.7.56	Skokholm
	+		28.10.56	Cabo Peñas : 43°39'N. 5°50'W. (Oviedo) <b>Spain</b>

383738	O	pull.	1.7.55	Skomer : 51°44'N. 5°19'W. (Pembrokeshire) WWFS
	()		8.12.55	Plouescat : 48°40'N. 4°12'W. (Finistère) <b>France</b>
AT6280		ad.	21.7.50	Lundy : 51°12'N. 4°40'W. (Devon)
	×		15.2.54	Javea : 38°48'N. 0°10'E. (Alicante) <b>Spain</b>
AT18432	O	pull.	5.7.55	Lundy
	×		18.3.56	le Croisic : 47°18'N. 2°31'W. (Loire Atlantique) <b>France</b>

**Guillemot (*Uria aalge*)**

AT45576		ad.	19.7.56	Farne Islands : 55°37'N. 1°37'W. (Northumberland) ND&N
	+		0.10.56	Skagen : 57°44'N. 10°37'E. (Jutland) <b>Denmark</b>
AT10968		ad.	5.7.54	Lundy : 51°12'N. 4°40'W. (Devon)
	×		(28.8.56)	St. Helier, Jersey, Channel Islands 175m. S.E.
AT18549	O	pull.	7.7.55	Lundy
	×		6.3.56	Zandvoort : 52°22'N. 4°31'E. (N.-Holland)
AT35963	O	pull.	23.6.56	Lundy
	×		11.9.56	Quiberon : 47°29'N. 3°07'W. (Morbihan) <b>France</b>
AT35968	O	pull.	23.6.56	Lundy
	×		26.8.56	Nr. St. M'lo : 48°39'N. 2°03'W. (Ille-et-Vilaine) <b>France</b>
AT35919	O	pull.	23.6.56	Lundy
	×		24.10.56	Ile d'Oleron : 45°57'N. 1°14'W. (Charente Maritime) <b>France</b>
AT14865		ad.	12.7.56	Lundy
	×		(9.8.56)	le Croisic : 47°18'N. 2°31'W. (Loire Atlantique) <b>France</b>
AT14901	O	pull.	20.7.56	Lundy
	()		14.10.56	Off Sandøyene Bulandet : 61°18'N. 4°35'E. (Sogn og Fjordane) <b>Norway</b>

Three other birds ringed on Lundy were recovered at Southbourne, Hampshire (*ca.* 12.9.56), Portsmouth (6.9.56) and Lowestoft (14.9.56).

**Puffin (*Fratercula arctica*)**

AX3705	O	pull.	12.8.51	Skokholm : 51°42'N. 5°16'W. (Pembrokeshire)
	×		18.8.56	Brighton (Sussex) 230m. E.S.E.
AX7625		ad.	12.7.52	Skokholm
	+		5.10.56	Nr. Florö : 61°28'N. 5°10'E. (Sogn og Fjordane) <b>Norway</b>
AT12943		ad.	10.5.53	Skokholm
	×		6.12.56	Troon (Ayrshire) 270m. N.
AT17955		ad.	17.5.54	Skokholm
	×		21.8.56	Nr. St. Clements, Jersey, Channel Islands 225m. S.E.
AT23534		ad.	10.7.54	Skokholm
	×		8.10.56	Locquemeau : 48°43'N. 3°35'W. (Côtes-du-Nord) <b>France</b>

**Woodpigeon (*Columba palumbus*)**

394156	O	pull.	30.7.55	Nr. Boroughbridge : 54°05'N. 1°24'W. (Yorkshire) JRM
	+		11.2.56	Grasby (Lincolnshire) 55m. S.E.
379425	O	pull.	12.7.55	Wellesbourne : 52°12'N. 1°36'W. (Warwickshire) JAN
	×		14.1.56	Nr. Ashford (Kent) 120m. S.E.

**Turtle Dove (*Streptopelia turtur*)**

383787	O	pull.	10.6.56	Nr. Swaffham : 52°38'N. 0°41'E. (Norfolk) CBO
	v		1.9.56	Mindelo : 41°18'N. 8°44'W. (Douro Litoral) <b>Portugal</b>
285353		ad.	14.6.55	Abbeiton : 51°50'N. 0°53'E. (Essex)
	+		20.5.56	Soulac : 45°31'N. 1°06'W. (Gironde) <b>France</b>

247388	ad.	19.7.54	Abberton	
+		3.9.56	Nr. Pouyastruc : 43°16'N. 0°11'E. (Hautes-Pyrénées) <b>France</b>	
291515	ad.	30.6.55	Abberton	
+		15.5.56	Villarta de San Juan : 39°15'N. 3°24'W. (Ciudad Real) <b>Spain</b>	
286184	juv.	8.7.56	Bradwell-on-Sea : 51°44'N. 0°54'E. (Essex) BBO	
+		6.11.56	San Juan de Enova : 39°02'N. 0°25'W. (Valencia) <b>Spain</b>	

This is the most easterly recovery so far recorded.

### Cuckoo (*Cuculus canorus*)

259019	ad.	16.5.55	Spurn Point : 53°35'N. 0°06'E. (Yorkshire)	
×		15.8.56	Nr. Pavia : 45°12'N. 9°09'E. (Lombardy) <b>Italy</b>	
259154	ad. ♂	11.8.54	Gibraltar Point : 53°06'N. 0°21'E. (Lincolnshire)	
×		(22.8.56)	Nr. Leuze : 50°35'N. 3°35'E. (Hainaut) <b>Belgium</b>	
239112	juv.	29.7.52	Lundy : 51°12'N. 4°40'W. (Devon)	
+		25.8.56	Moirax : 44°09'N. 0°36'E. (Lot-et-Garonne) <b>France</b>	

### Barn Owl (*Tyto alba*)

AF7708	ad. ♀	16.8.54	Nr. Chathill : 55°33'N. 1°41'W. (Northumberland) MHBO	
×		28.10.56	Dunblane (Perthshire) 96m. N.W.	

### Little Owl (*Athene noctua*)

372702	ad.	30.10.52	Dungeness : 50°55'N. 0°59'E. (Kent)	
×		(29.10.56)	Nr. Langley, Maidstone (Kent) 28m. N.W.	

### Tawny Owl (*Strix aluco*)

AN7614	O pull.	22.5.55	Currie : 55°54'N. 3°18'W. (Midlothian) IVBP	
v		24.6.56	North Broomhill, nr. Amble (Northumberland) 76m. S.E.	
AH1882	O pull.	2.5.54	Millburn, Duns : 55°46'N. 2°20'W. (Berwickshire) WM	
×		(28.8.56)	Nr. Ford (Northumberland) 14m. S.E.	

### Long-eared Owl (*Asio otus*)

AH2762	O pull.	22.5.56	Ballygomartin, Belfast : 54°35'N. 5°55'W. JAB	
×	ca.	15.8.56	Drains Bay, Larne (Antrim) 19m. N.N.E.	

### Swift (*Apus apus*)

B21268	O pull.	9.7.53	Oxford : 51°45'N. 1°15'W. EGI	
×		26.5.56	Bicester (Oxfordshire) 11m. N.N.E.	
B85723	ad.	17.7.54	St. Osyth : 51°49'N. 1°05'E. (Essex) RWA	
×		19.6.56	Kneesworth nr. Royston (Hertfordshire) 50m. W.N.W.	

### Swallow (*Hirundo rustica*)

C39681	O pull.	31.7.56	Nr. Colchester : 51°54'N. 0°52'E. (Essex) RVAM	
×		14.12.56	Magogong : 27°40'S. 24°47'E. (Cape Province) <b>South Africa</b>	
A22982	O pull.	16.7.55	Nr. Burnham-on-Crouch : 51°38'N. 0°56'E. (Essex) SWLS	
×		30.4.56	Nr. Champagne-Saint-Hilaire : 46°19'N. 0°20'E. (Vienne) <b>France</b>	
A71955	O pull.	10.8.55	South Ockendon : 51°32'N. 0°18'E. (Essex) RS	
×		0.1.56	Parys : 26°54'S. 26°58'E. (Orange Free State) <b>South Africa</b>	
B98877	O pull.	23.8.55	Longford : 51°29'N. 0°29'W. (Middlesex) B&T	
×	ca.	28.8.56	Burston, Diss (Norfolk) 90m. N.E.	
J7924	f.g.	6.7.52	Tresco : 49°58'N. 6°20'W. Isles of Scilly (Cornwall) LNHS	
×		29.4.56	Goux : 46°23'N. 0°42'E. (Vienne) <b>France</b>	



**Sand Martin** (*Riparia riparia*)

C37626	juv.	11.7.56	Rothley : 52°43'N. 1°07'W. (Leicestershire) L&R
×		30.7.56	Bardney (Lincolnshire) 47m. N.E.
B68326	ad.	11.8.54	Abberton : 51°50'N. 0°53'E. (Essex)
v		1.7.56	Rothley (Leicestershire) 100m. W.N.W.

**Raven** (*Corvus corax*)

410830	O	pull.	9.4.55	Belford : 55°36'N. 1°49'W. (Northumberland) MHBO
×			3.4.56	Glespin, <i>nr.</i> Douglas (Lanarkshire) 76m. W.

**Carrion Crow** (*Corvus corone*)

387141	O	pull.	27.6.54	<i>Nr.</i> Sedbergh : 54°19'N. 2°32'W. (Yorkshire) SS
+			16.11.56	Stake Fell, <i>nr.</i> Askrigg (Yorkshire) 19m. E.S.E.
386017	O	pull.	1.6.54	Bardsey : 52°46'N. 4°48'W. (Caernarvonshire)
×			(24.2.56)	Carreg, Pwllheli (Caernarvonshire) 17m. N.E.

**Rook** (*Corvus frugilegus*)

3004703	juv.	4.7.55	Ballymena : 54°52'N. 6°17'W. (Antrim) RSD
×		(31.5.56)	<i>Nr.</i> Newtownards (Down) 31m. S.E.

**Jay** (*Garrulus glandarius*)

394722	O	pull.	10.6.55	<i>Nr.</i> Mundford : 52°31'N. 0°39'E. (Norfolk) LHBC
+			21.3.56	<i>Nr.</i> Fulbourn (Cambridgeshire) 28m. S.W.
388319	O	pull.	4.6.55	Wytham : 51°47'N. 1°19'W. (Berkshire) EGI
+			10.2.56	Barnt Green (Worcestershire) 48m. N.W.

**Blue Tit** (*Parus caeruleus*)

F8100	ad.	18.12.49	Rothwell : 52°25'N. 0°48'W. (Northamptonshire) BS
×		4.1.56	Frilford Heath, <i>nr.</i> Abingdon (Berkshire) 55m. S.S.W.
B70800	O	pull.	Godalming : 51°11'N. 0°37'W. (Surrey) CS
×		(3.6.56)	Banbury (Oxfordshire) 66m. N.W.
B56028	ad.	16.2.54	Sevenoaks : 51°16'N. 0°12'E. (Kent) LNHS
×		4.8.56	Kew (Surrey) 25m. N.W.

**Treecreeper** (*Certhia familiaris*)

KL217	ad. ♂	15.7.52	Everingham : 53°53'N. 0°46'W. (Yorkshire) JWL
v		18.4.56	Allerthorpe (Yorkshire) 3m. N.N.W.

This is the first recovery for this species.

**Mistle Thrush** (*Turdus viscivorus*)

259167	f.g.	15.9.55	Gibraltar Point : 53°06'N. 0°21'E. (Lincolnshire)
×		24.3.56	Hatfield Broad Oak (Essex) 82m. S.

**Fieldfare** (*Turdus pilaris*)

270083	ad.	7.2.54	Goxhill : 53°41'N. 0°20'W. (Lincolnshire) HVDB
[/?]		17.2.56	Quimperle : 47°52'N. 3°33'W. (Finistère) <b>France</b>
S36669	ad.	29.12.55	Welwyn : 51°50'N. 0°13'W. (Hertfordshire) RR
+		4.2.56	<i>Nr.</i> Portugalete : 43°20'N. 3°02'W. (Vizcaya) <b>Spain</b>
S25332	ad.	24.2.56	Ewhurst : 51°09'N. 0°27'W. (Surrey) R&W
+		(23.7.56)	Reinsvoll : 60°40'N. 10°39'E. (Opland) <b>Norway</b>

**Song Thrush** (*Turdus philomelos*)

P8981	f.g.	19.5.53	Isle of May : 56°11'N. 2°33'W. (I'ife)
×		(19.2.56)	<i>Nr.</i> Liguge : 46°31'N. 0°20'E. (Vienne) <b>France</b>

S86007	f.g.	19.10.56	Isle of May
+		(21.11.56)	Taillis : 48°12'N. 1°14'W. (Ille et Vilaine) <b>France</b>
X52879	ad.	16.1.55	Nr. Seahouses : 55°35'N. 1°39'W. (Northumberland) MHBO
×		20.12.55	Nr. St. Fergus (Aberdeenshire) 140m. N.
X53260	ad.	29.1.55	Nr. Seahouses. MHBO
×	ca.1.11.56		Calder, Halkirk (Caithness) 220m. N.N.W.
W27609	O pull.	6.7.55	Dumfries : 55°04'N. 3°37'W. IFS
×		(27.2.56)	Nr. Portadown (Armagh) 120m. W.S.W.
S41963	f.g.	2.2.56	Moniaive : 55°12'N. 3°55'W. (Dumfriesshire) TT
×		(13.4.56)	Well, Bedale (Yorkshire) 110m. S.E.
X73142	pull.	21.5.55	Braithwaite : 54°36'N. 3°11'W. (Cumberland). RSt
+	ca.29.2.56		Nr. Villa Real : 41°18'N. 7°46'W. (Tras os Montes) <b>Portugal</b>
S18194	f.g.	15.9.55	Thornaby-on-Tees : 54°34'N. 1°20'W. (Yorkshire) PAR
×		2.2.56	Port Seaton (East Lothian) 115m. N.N.W.
X25300	ad.	23.2.55	Old Colwyn : 53°17'N. 3°44'W. (Denbighshire) AEM
()		3.2.56	Nr. Philipstown (Offaly) 140m. W.
W19562	f.g.	22.10.55	Bradwell : 51°44'N. 0°54'E. (Essex) BBO
×		19.2.56	St. Pol de Leon : 48°42'N. 4°00'W. (Finistère) <b>France</b>
PS306	pull.	28.4.55	Shenfield : 51°38'N. 0°19'E. (Essex) RS
×		(21.4.56)	Oviedo : 43°23'N. 5°50'W. <b>Spain</b>
S18911	ad.	8.10.55	Hainault : 51°35'N. 0°11'E. (Essex) LNHS
×	ca.7.3.56		Donville-les-Bains : 48°51'N. 1°34'W. (Manche) <b>France</b>
W22280	juv.	13.7.55	Chilton : 51°34'N. 1°17'W. (Berkshire) OOS
×		(21.1.56)	Ilfracombe (Devon) 130m. W.S.W.
X91211	ad.	1.3.55	St. James's Park : 51°30'N. 0°08'W. London LNHS
×		24.6.56	Fakenham (Norfolk) 100m. N.N.E.

**Redwing (*Turdus musicus*)**

W14621	ad.	16.10.55	Fair Isle : 59°32'N. 1°37'W. (Shetland)
+		16.11.56	Tralee (Kerry) 580m. S.W.
W15409	f.g.	20.2.55	Anstruther : 56°13'N. 2°41'W. (Fife) WJE
+		9.1.56	Le Martinet : 44°15'N. 4°05'E. (Gard) <b>France</b>
P8944	f.g.	27.3.53	Isle of May : 56°11'N. 2°33'W. (Fife)
×		29.1.56	Omagh (Tyrone) 215m. S.W.
S27280	ad.	1.11.55	Nr. Seahouses : 55°35'N. 1°39'W. (Northumberland) MHBO
×		6.2.56	Dunbar (East Lothian) 42m. N.W.
X14689	f.g.	18.2.56	Worcester Park : 51°24'N. 0°15'W. (Surrey) LNHS
×		27.4.56	Nr. Preetzen : 53°55'N. 13°35'E. (Mecklenburg) <b>Germany</b>
X72609	1stW.	13.11.55	Dungeness : 50°55'N. 0°59'E. (Kent)
×		23.2.56	Portsall : 48°33'N. 4°42'W. (Finistère) <b>France</b>

**Ring Ouzel (*Turdus torquatus*)**

X74932	juv.	15.9.56	Bardsey : 52°46'N. 4°48'W. (Caernarvonshire)
+		14.10.56	Nr. Villefranche-de-Longchapt : 44°52'N. 0°06'E. (Dordogne) <b>France</b>
S58403	ad. ♂	18.10.56	Dungeness : 50°55'N. 0°59'E. (Kent)
+		28.10.56	Teillet : 43°50'N. 2°20'E. (Tarn) <b>France</b>

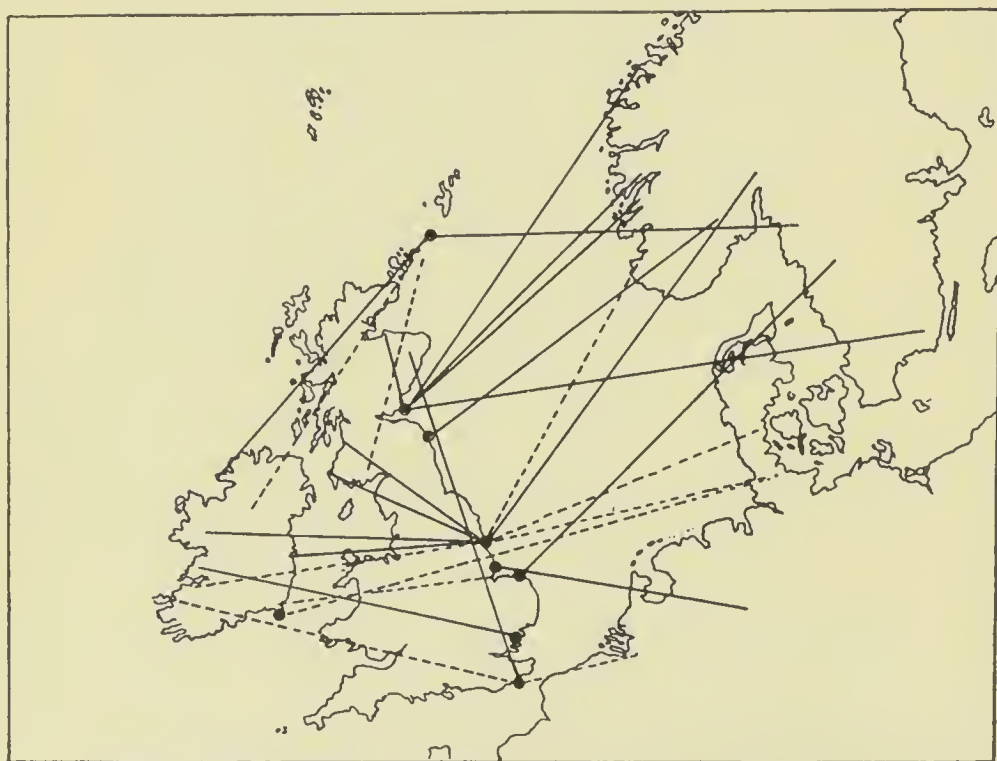
**Blackbird (*Turdus merula*)**

W14831	ad. ♂	26.3.56	Fair Isle : 59°32'N. 1°37'W. (Shetland)
+		2.4.56	Nr. Halden : 59°05'N. 11°25'E. (Östfold) <b>Norway</b>

X66021	f.g. ♂	17.10.55	Isle of May : 56°11'N. 2°33'W. (Fife)
×		(27.3.56)	Nr. Elgin (Moray) 110m. N.N.W.
S40804	1stW. ♂	22.9.56	Nr. Pateley Bridge : 54°05'N. 1°45'W. (Yorkshire)
			ESS
×		11.11.56	Clachan (Argyll) 165m. N.W.
X92686	f.g. ♂	7.4.55	Spurn Point : 53°35'N. 0°06'E. (Yorkshire)
v		20.2.56	Bannow (Wexford) 300m. W.S.W.
×		3.6.56	Cleethorpes (Lincolnshire)

Cleethorpes is about seven miles from where the bird was originally ringed.

X92482	f.g. ♂	8.10.55	Spurn Point
v		26.4.56	Isle of May (Fife) 210m. N.W.
X92766	f.g. ♂	20.10.55	Spurn Point
×		12.3.56	Nr. Irvine (Ayrshire) 240m. N.W.
X92918	f.g. ♀	23.10.55	Spurn Point
×		27.3.56	Stranraer (Wigtownshire) 220m. N.W.
S33450	juv.	14.8.56	Oxford : 51°45'N. 1°15'W. OOS
×		27.11.56	Llandudno (Caernarvonshire) 150m. N.W.
W37654	f.g. ♀	24.10.55	Dungeness : 50°55'N. 0°59'E. (Kent)
×		(10.2.56)	Andover (Hampshire) 105m. W.N.W.
X72521	f.g. ♀	29.10.55	Dungeness
()		17.1.56	Methlick (Aberdeenshire) 470m. N.N.W.



MAP 3—SELECTED RECOVERIES OF BLACKBIRDS (*Turdus merula*) RINGED AT BIRD OBSERVATORIES

The places of ringing are marked by black dots. Recoveries reported up to the first autumn after ringing are indicated by continuous lines; those for subsequent seasons by broken lines (for months of recoveries, see Table E).



In all 33 Blackbirds ringed in Great Britain were recovered abroad, or in Ireland, as follows:—

TABLE E—COUNTRY AND MONTH OF RECOVERY OF BLACKBIRDS (*Turdus merula*)

Country of recovery	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Total
Norway ...	...	I					2			3		3	9
Sweden ...	...						I	I		I	I		4
Denmark ...	...									2			2
Germany...	...	I				I	I			I		I	5
Holland (I) & Belgium (I)	...				I		I						2
Ireland ...	...			3	5	I	2						11

See footnote to Table A.

### Wheatear (*Oenanthe oenanthe*)

A62404	1st S. ♂	19.5.56	Fair Isle : 59°32'N. 1°37'W. (Shetland)
×		22.5.56	At sea N.W. of Faeroes ca. 300m. N.W.
A62755	juv.	12.7.56	Fair Isle
×		28.8.56	Lit et Mixe : 44°02'N. 1°15'W. (Landes) <b>France</b>
A62897	juv.	21.7.56	Fair Isle
v		10.9.56	Beachy Head (Sussex) 610m. S.S.E.

### Whinchat (*Saxicola rubetra*)

B65344	1st W. ♀	6.9.56	Fair Isle : 59°32'N. 1°37'W. (Shetland)
×		10.10.56	Nr. Petersfield (Hampshire) 590m. S.
B72386	f.g.	29.8.54	Dungeness : 50°55'N. 0°59'E. (Kent)
×		8.5.56	Kilmelford (Argyll) 450m. N.E.

### Redstart (*Phoenicurus phoenicurus*)

A11112	ad. ♀	16.5.55	Isle of May : 56°11'N. 2°33'W. (Fife)
×		ca.20.9.56	Cabara : 44°50'N. 0°08'W. nr. Branne (Gironde) <b>France</b>
A78296	ad. ♂	13.4.56	Dungeness : 50°55'N. 0°59'E. (Kent)
[?]		ca.14.10.56	Nr. Miranda do Douro : 41°30'N. 6°16'W. (Tras os Montes) <b>Portugal</b>

### Black Redstart (*Phoenicurus ochruros*)

CI6337	juv.	9.10.56	Spuin Point : 53°35'N. 0°06'E. (Yorkshire)
[?]		2.11.56	Gijón : 43°32'N. 5°40'W. (Oviedo) <b>Spain</b>
A30568	O pull.	10.6.55	Cripplegate : 51°31'N. 0°05'W. London. LNHS
×		10.3.56	Douarnenez : 48°05'N. 4°20'W. (Finistère) <b>France</b>

This is the first foreign recovery of a Black Redstart ringed in Britain as a nestling.

A78410	f.g. ♀	25.3.56	Dungeness : 50°55'N. 0°59'E. (Kent)
×		6.5.56	Nr. Xanten : 51°40'N. 6°27'E. (Nordrhein-Westfalen) <b>Germany</b>

### Nightingale (*Luscinia megarhynchos*)

LK172	ad.	17.8.52	Dungeness : 50°55'N. 0°59'E. (Kent)
()		18.9.53	Nr. Vila Real de Santo Antonio : 37°13'N. 7°26'W. (Algarve) <b>Portugal</b>
A36832	×	1st W. 10.9.55	Portland Bill : 50°31'N. 2°27'W. (Dorset)
×		27.4.56	Newport Pagnell (Buckinghamshire) 130m. N.E.

These are the first recoveries of Nightingales showing movement.

**Robin** (*Erithacus rubecula*)

C25973	juv.	2.7.56	Leicester : 52°38'N. 1°05'W. L&R
×		7.10.56	Oxford. 60m. S.

**Grasshopper Warbler** (*Locustella naevia*)

C18846	f.g.	5.5.56	Bardsey : 52°46'N. 4°48'W. (Caernarvonshire)
×		9.6.56	Ahoghill, nr. Ballymena (Antrim) 155m. N.N.W.

This is the first recovery of a Grasshopper Warbler.

**Sedge Warbler** (*Acrocephalus schoenobaenus*)

A63455	1stW.	30.8.55	Avoch : 57°34'N. 4°10'W. (Ross-shire) JL
×		14.5.56	Nr. Rhyl (Flintshire) 295m. S.
A54711	f.g.	27.8.55	Dungeness : 50°55'N. 0°59'E. (Kent)
×		12.6.56	Amesbury (Wiltshire) 118m. W.

**Whitethroat** (*Sylvia communis*)

C22581	O	pull.	16.6.56	Alnwick : 55°24'N. 1°42'W. (Northumberland) MHBO
×			ca.22.9.56	Oporto : 41°09'N. 8°37'W. (Douro Litoral) <b>Portugal</b>
A94432	O	pull.	11.6.56	Harrogate : 54°00'N. 1°33'W. (Yorkshire) Sa&W
+			end 8.56	Bragança : 41°47'N. 6°46'W. (Tras os Montes) <b>Portugal</b>
A39429	ad. ♂		19.8.56	Halifax : 53°43'N. 1°51'W. (Yorkshire) HSS
v			13.9.56	Montforte de Lemos : 42°32'N. 7°30'W. (Lugo) <b>Spain</b>
A15768	ad.		7.8.55	Nr. Clifden : 53°29'N. 10°06'W (Galway) OOS
×			9.5.56	Dinard 48°38'N. 2°03'W. (Ille-et-Vilaine) <b>France</b>
B96669	juv.		19.6.55	Nuneaton : 52°31'N. 1°28'W. (Warwickshire) L&R
v			11.6.56	Goeree lightship : 51°56'N. 3°40'E. North Sea

Note unusually late date of passage.

A60532	ad. ♀		17.5.56	Lundy : 51°12'N. 4°40'W. (Devon)
()			9.10.56	Nr. Cardigos : 39°34'N. 8°02'W. (Beira-Baixa) <b>Portugal</b>
C27921	f.g.		25.8.56	Littlestone : 50°59'N. 0°58'E. (Kent) DBO
×			23.9.56	Bilbao : 43°15'N. 2°56'W. (Viscaya) <b>Spain</b>
LK179	ad. ♂		17.8.52	Dungeness : 50°55'N. 0°59'E. (Kent)
v			11.9.56	Lundy (Devon) 245m. W.
B48249	f.g.		15.8.54	Dungeness
×			(14.11.56)	St. Etienne de Baigorry : 43°11'N. 1°20'W. (Basses-Pyrénées) <b>France</b>
C14815	ad. ♂		18.5.56	Dungeness
+			ca.5.10.56	Nr. Bragança : 41°45'N. 6°46'W. (Tras os Montes) <b>Portugal</b>
C27176	juv.		27.7.56	Dungeness
+			ca.28.10.56	Nr. Figueira da Foz : 40°09'N. 8°51'W. (Beira Litoral) <b>Portugal</b>
C27798	juv.		22.8.56	Dungeness
+			27.9.56	Mangualde : 40°36'N. 7°46'W. (Beira Alta) <b>Portugal</b>
C27814	juv.		22.8.56	Dungeness
+			(19.9.56)	Nr. Mirandela : 41°26'N. 7°21'W. (Tras os Montes) <b>Portugal</b>
C41504	juv.		9.9.56	Dungeness
×			ca.1.10.56	Nr. Portimão : 37°08'N. 8°32'W. (Algarve) <b>Portugal</b>
C60351	juv.		28.9.56	Dungeness
+			7.10.56	Nr. Bayonne : 43°32'N. 1°29'W. (Basses-Pyrénées) <b>France</b>

**Lesser Whitethroat** (*Sylvia curruca*)

Cr2290	f.g.	25.8.56	Romford : 51°35'N. 0°11'E. (Essex) HE&W
+		23.9.56	Nr. Brescia : 45°33'N. 10°13'E. Italy

**Willow Warbler** (*Phylloscopus trochilus*)

B75847	f.g.	5.5.56	Isle of May : 56°11'N. 2°33'W. (Fife)
×		6.5.56	Nr. Grantown-on-Spey (Moray) 87m. N.N.W.
B95682	juv.	31.7.55	Gibraltar Point : 53°06'N. 0°21'E. (Lincolnshire)
+		13.10.56	Nr. Mirandela : 41°28'N. 7°10'W. (Tras os Montes) <b>Portugal</b>
A69789	f.g.	18.8.55	Nr. Colchester : 51°54'N. 0°52'E. (Essex) RVAM
×		14.7.56	Langholm (Dumfriesshire) 275m. N.W.

**Chiffchaff** (*Phylloscopus collybita*)

C59496	f.g.	14.9.56	Sandwich Bay : 51°17'N. 1°20'E. (Kent) SBRS
×		23.9.56	Nr. Stow-on-the-Wold (Gloucestershire) 135m. W.N.W.

**Wood Warbler** (*Phylloscopus sibilatrix*)

A39188	O	pull.	15.6.56	Lyndhurst : 50°53'N. 1°35'W. (Hampshire) RE
+			15.8.56	Teolo : 45°22'N. 11°43'E. (Padova) <b>Italy</b>

**Golderest** (*Regulus regulus*)

C60633	f.g.♀	20.10.56	Dungeness : 50°55'N. 0°59'E. (Kent)
×		27.10.56	Headley Down, nr. Bordon (Hampshire) 77m. W.

**Spotted Flycatcher** (*Muscicapa striata*)

A11278	ad.	23.8.55	Isle of May : 56°11'N. 2°33'W. (Fife)
×		29.7.56	Nr. Strandebarm : 60°15'N. 6°02'E. (Hordaland) <b>Norway</b>
C48039	juv.	8.9.56	Skokholm : 51°42'N. 5°16'W. (Pembrokeshire)
()		4.10.56	Ancião : 39°55'N. 8°26'W. (Beira Litoral) <b>Portugal</b>
C14772	f.g.	17.5.56	Dungeness : 50°55'N. 0°59'E. (Kent)
×		20.9.56	Nr. Newtownstewart (Tyrone) 430m. N.W.

**Pied Flycatcher** (*Muscicapa hypoleuca*)

B19018	O	pull.	12.7.55	Nr. Alnwick : 55°23'N. 1°54'W. (Northumberland) ND&N
×			11.5.56	Nr. Leiden : 52°10'N. 4°30'E. (Zuid-Holland)
A53221	O	pull.	27.6.56	Nr. Ullswater : 54°35'N. 2°52'W. (Westmorland) FCG
()			(17.9.56)	Sezimbra : 38°26'N. 9°06'W. (Estremadura) <b>Portugal</b>
WP785	O	pull.	12.6.54	Ripley : 54°03'N. 1°34'W. nr. Harrogate (Yorkshire) Sa&W
×			14.5.56	Blaenau Ffestiniog (Merionethshire) 120m. S.W.
C49284	1stW.		10.9.56	Bardsey : 52°46'N. 4°48'W. (Caernarvonshire)
+		ca.17.10.56		Nr. Cantanhede : 40°20'N. 8°36'W. (Beira Litoral) <b>Portugal</b>
C52221	f.g.		7.9.56	Covehithe : 52°22'N. 1°43'E. (Suffolk) HE&W
()		ca.28.9.56		Abiul : 39°52'N. 8°32'W. nr. Pombal (Beira Litoral) <b>Portugal</b>
C50100	f.g.		2.9.56	Walberswick : 52°18'N. 1°41'E. (Suffolk) DBC
×			25.9.56	Nr. Carrazeda de Anciães : 41°14'N. 7°16'W. (Tras os Montes) <b>Portugal</b>
A51836	O	pull.	21.6.56	Parkend : 51°46'N. 2°33'W. (Gloucestershire) C&C
+			ca.6.10.56	Quintanilha : 41°45'N. 6°35'W. nr. Bragança (Tras os Montes) <b>Portugal</b>
C37016	O	pull.	22.6.56	Parkend C&C
v			(20.9.56)	Nr. Vinhais : 41°45'N. 7°01'W. (Tras os Montes) <b>Portugal</b>



**Meadow Pipit (*Anthus pratensis*)**

MM137	f.g.	19.5.53	Fair Isle : 59°32'N. 1°37'W. (Shetland)
()	ca.1954		Puebla del Rio : 37°16'N. 6°04'W. (Sevilla) <b>Spain</b>
A11538	f.g.	17.4.56	Isle of May : 56°11'N. 2°33'W. (Fife)
+	28.10.56		Nr. Silves : 37°11'N. 8°26'W. (Algarve) <b>Portugal</b>
LJ517	juv.	5.8.55	Nr. Seahouses : 55°35'N. 1°39'W. (Northumberland) MHBO
/?/	16.10.55		Nr. Bayonne : 43°30'N. 1°28'W. (Basses-Pyrénées) <b>France</b>
C52965	1stW.	19.9.56	Beadnell : 55°33'N. 1°37'W. (Northumberland) MHBO
/?/	15.10.56		Biarritz : 43°29'N. 1°33'W. (Basses-Pyrénées) <b>France</b>
B57090	O pull.	20.7.54	Nr. Appleby : ca. 54°40'N. 2°30'W. (Westmorland) JCC
+	ca.22.2.56		Nr. Lousa : 41°11'N. 7°11'W., Moncorvo (Tras os Montes) <b>Portugal</b>
B69585	juv.	6.8.55	Spurn Point : 53°35'N. 0°06'E. (Yorkshire)
()	4.1.56		Nr. Isla Cristina : 37°14'N. 7°20'W. (Huelva) <b>Spain</b>
A12305	O pull.	1.6.55	Cley : 52°58'N. 1°03'E. (Norfolk)
/?/	10.2.56		Nr. Gijon : 43°33'N. 5°40'W. (Oviedo) <b>Spain</b>
A67563	ad.	1.10.55	Abberton : 51°50'N. 0°53'E. (Essex)
()	30.10.56		Cheles : 38°31'N. 7°16'W. (Badajoz) <b>Spain</b>
A67624	ad.	13.10.55	Abberton
×	7.5.56		Porkeri : 61°29'N. 6°45'W. Suduroy, <b>Faeroes</b>
A55427	juv.	4.10.55	Dungeness : 50°55'N. 0°59'E. (Kent)
/?/	13.12.56		Villar del Pedroso : 39°43'N. 5°11'W. (Cáceres) <b>Spain</b>
A55456	f.g.	7.10.55	Dungeness
+	(16.2.56)		Nr. Lucena del Puerto : 37°17'N. 6°39'W., Bonares (Huelva) <b>Spain</b>

**Pied Wagtail (*Motacilla alba yarrellii*)**

LF514	juv.	26.7.52	Isle of May : 56°11'N. 2°33'W. (Fife)
+	19.3.56		Ortuella : 43°19'N. 3°04'W., Bilbao (Vizcaya) <b>Spain</b>
LJ487	juv.	21.7.55	Nr. Seahouses : 55°35'N. 1°39'W. (Northumberland) MHBO
+	0.2.56		Nr. Lorient : 47°45'N. 3°21'W. (Morbihan) <b>France</b>
B29700	juv.	3.8.53	Nr. Seahouses MHBO
×	0.2.56		Newhaven (Sussex) 340m. S.S.E.
B20292	O pull.	5.6.54	Nr. Hamsterley : 54°41'N. 1°50'W. (Durham) ND&N
/?/	26.4.56		Sunde : 59°50'N. 5°43'E. (Hordaland) <b>Norway</b>
BP195	juv.	2.7.49	Nr. Clitheroe : 53°53'N. 2°24'W. (Lancashire) JJB
/?/	18.1.56		Nr. St. Pol de Leon : 48°42'N. 4°00'W. (Finistère) <b>France</b>
LB733	juv.	30.8.52	Halifax : 53°43'N. 1°51'W. (Yorkshire) HSS
+	13.3.56		Nr. Le Temple de Bretagne : 47°20'N. 1°46'W. (Loire-Atlantique) <b>France</b>
A82214	juv.	9.6.56	Abberton : 51°50'N. 0°53'E. ( <b>Essex</b> )
/?/	(18.11.56)		Odivelas : 38°47'N. 9°11'W. (Estremadura) <b>Portugal</b>

**Grey Wagtail (*Motacilla cinerea*)**

B57034	O pull.	12.7.54	Nr. Appleby : ca. 54°40'N. 2°30'W. (Westmorland) JCC
×	15.11.56		Pilsley, Chesterfield (Derbyshire) 110m. S.S.E.
B63019	O pull.	7.6.54	Belfast : 54°35'N. 5°56'W. (Antrim) HG
v	13.1.56		Nr. Kilcullen (Kildare) 108m. S.S.W.

**Yellow Wagtail (*Motacilla flava flavissima*)**

B66931	juv.	22.7.54	Abberton : 51°50'N. 0°53'E. (Essex)
×	30.4.56		Villa del Rio : 37°59'N. 4°17'W. (Córdoba) <b>Spain</b>

391604	ad. ♂	15.4.55	Abberton
×		24.9.56	Pola de Siero : 43°24'N. 5°39'W. (Oviedo) <b>Spain</b>
182322	juv.	25.6.56	Abberton
( )		(17.9.56)	Fátima : 39°37'N. 8°39'W. (Beira Litoral) <b>Portugal</b>
182299	juv.	25.6.56	Abberton
( )		30.9.56	Nr. Matozinhos : 41°11'N. 8°42'W. (Douro Litoral) <b>Portugal</b>

### Starling (*Sturnus vulgaris*)

30158	juv. ♂	13.9.54	Fair Isle : 59°32'N. 1°37'W. (Shetland)
×		18.6.56	Midmar (Aberdeenshire) 160m. S.S.W.
626147	1stW. ♀	18.9.55	Nr. Seahouses : 55°35'N. 1°39'W. (Northumberland) MHBO
×		(26.10.56)	Nr. Huddersfield (Yorkshire) 140m. S.
627021	1stW. ♂	19.9.55	Nr. Seahouses. MHBO
×		19.4.56	Chorley (Lancashire) 140m. S.S.W.
W29896	ad.	25.4.55	Ilkley : 53°55'N. 1°50'W. (Yorkshire) WNS
×		3.12.56	Longford (Longford) 240m. W.
W11149	juv.	26.6.54	Nr. Romford : 51°35'N. 0°11'E. (Essex) RRS
×		(7.5.56)	Nr. Boulogne : 50°43'N. 1°37'E. (Pas de Calais) <b>France</b>
623517	juv.	7.8.55	Nr. Romford. RRS
×		15.7.56	Nr. Hamburg : 53°33'N. 10°00'E. <b>Germany</b>

The following five recoveries are probably an indication of the cold-weather movement of Starlings which was observed to take place in February, 1956 :

W36047	juv.	12.9.55	Cholsey : 51°34'N. 1°09'W. (Berkshire) OOS
×		27.2.56	Nr. Tenby (Pembrokeshire) 150m. W.
6514796	juv.	4.6.55	Nr. Romford. RRS
×		ca.28.2.56	Nantgaredig (Carmarthenshire) 190m. W.
6515001	juv.	5.6.55	Nr. Romford. RRS
×		13.3.56	Hatherleigh (Devon) 200m. W.S.W.
622396	juv.	17.7.55	Nr. Romford. RRS
×		13.2.56	Waterford (Waterford) 310m. W.
6523099	juv.	3.8.55	Nr. Romford. RRS
×		28.2.56	Porthleven (Cornwall) 260m. W.S.W.

One hundred and nineteen Starlings ringed in the winter were recovered abroad as follows :—

TABLE F—COUNTRY AND MONTH OF RECOVERY OF STARLINGS (*Sturnus vulgaris*)

Country of recovery	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.
France (2) ...	...		1						1			
Belgium (6) and Holland (14) ...	...	3	2	1	1	1	1	8	1		1	1
Denmark (14) ...	...	1	4	1	1	1	2	3				
Norway (5) and Sweden (16) ...	...		4	7	5	1	2		2			
Germany (18) ...	...	2	3	1	2	4	3	1	2			
Poland (13) ...	...	3	5	1	2			2				
Finland (3) and U.S.S.R. (25) ...	...	1	7	5	4	4	5	2				

NOTE.—Three recoveries (from Holland, Germany and the U.S.S.R.) have been omitted due to vague recovery dates. See also footnote to Table A.

The months of ringing for these birds were :—October, 4 ; November, 12 ; December, 15 ; January, 27 ; February, 43 ; and March, 18. The extreme dates were 20th October and 20th March.

**Greenfinch** (*Chloris chloris*)

X64648	f.g.	26.9.55	Nr. Seahouses : 55°35'N. 1°39'W. (Northumberland)	MHBO
( )		(22.2.56)	Sacriston (Durham) 51m. S.	
X53032	ad. ♂	12.1.55	Nr. Seahouses	MHBO
×		27.4.56	Nr. Darlington (Durham) 73m. S.	
So878	ad. ♂	16.2.53	Halifax : 53°43'N. 1°51'W. (Yorkshire)	HSS
×		11.5.56	Nr. Woore (Shropshire) 55m. S.S.W.	
X86393	O pull.	28.5.55	Chartley : 52°51'N. 1°59'W. nr. Stafford	AHJ
( )		(28.2.56)	Nr. Saldana : 42°31'N. 4°46'W. (Palencia)	Spain

This is the second Greenfinch ringed as a nestling to be recovered abroad, there being one previous record of a bird in France.

W30372	ad. ♂	20.6.55	Abberton : 51°50'N. 0°53'E. (Essex)	
v		10.1.56	Nr. Auchel : 50°30'N. 2°29'E. (Pas de Calais)	France

**Goldfinch** (*Carduelis carduelis*)

A34893	O pull.	15.6.56	Hythe : 51°05'N. 1°05'E. (Kent)	DBO
v		7.11.56	Soignies : 50°35'N. 4°04'E. (Hainaut)	Belgium

This is the second foreign recovery of a Goldfinch and the first of a bird ringed in Britain as pullus.

**Linnet** (*Carduelis cannabina*)

Cr6582	f.g. ♀	27.4.56	Spurn Point : 53°35'N. 0°06'E. (Yorkshire)	
[?]		(19.7.56)	Whitwell (Derbyshire) 57m. W.S.W.	

**Chaffinch** (*Fringilla coelebs*)

BF 466	ad. ♂	11.11.49	Nr. Great Budworth : 53°18'N. 2°30'W. (Cheshire)	AWB
[?]		14.6.56	Ytre Aina : 60°28'N. 5°25'E. nr. Bergen (Hordaland)	Norway
B76705	ad. ♂	22.12.55	Nr. Great Budworth	AWB
×		25.5.56	Nr. Bollnäs : 61°13'N. 16°12'E. (Hälsingland)	Sweden
F2267	ad.	5.10.49	Gibraltar Point : 53°06'N. 0°21'E. (Lincolnshire)	
×		14.2.56	Nr. Denekamp : 52°21'N. 7°00'E. (Overijssel)	Holland
B9059c	juv.	21.8.54	Leicester : 52°39'N. 1°08'W. L&R	
×		ca.15.6.56	Willoughby, nr. Alford (Lincolnshire) 67m. N.E.	
A81412	ad. ♂	13.11.55	Great Saltee : 52°07'N. 6°35'W. (Wexford)	
( )		19.10.56	Nr. Kortrijk : 50°48'N. 3°20'E. (West Flanders)	Belgium
JW917	ad. ♂	12.2.55	Brentwood : 51°38'N. 0°18'E. (Essex)	SWLS
( )		2.4.56	Noord-Hinder lightship : 51°39'N. 2°34'E. North Sea	115m. E.
A73346	f.g. ♂	17.3.56	Romford : 51°35'N. 0°11'E. (Essex)	HE&W
×		15.5.56	Vassunda : 59°43'N. 17°42'E. (Uppland)	Sweden
JE877	ad. ♂	10.3.53	Upminster : 51°34'N. 0°15'E. (Essex)	RS
( )		27.10.56	St. Niklaas : 51°10'N. 4°09'E. (East Flanders)	Belgium
B63560	f.g. ♂	12.2.55	Nr. Bristol : 51°27'N. 2°35'W. GEC	
×		26.8.56	Leksand : 60°44'N. 15°00'E. (Kopparberg)	Sweden
A85222	ad. ♂	17.3.56	Addington : 51°22'N. 0°02'W. (Surrey)	LNHS
×		14.11.56	Howth (Dublin) 280m. N.W.	

**Brambling** (*Fringilla montifringilla*)

A95929	ad. ♀	25.2.56	Romford : 51°35'N. 0°11'E. (Essex)	RRS
×		26.3.56	Burgsteinfurt : 52°09'N. 7°21'E. (Nordrhein)	Germany



**Reed Bunting** (*Emberiza schæniclus*)

65702	juv.	14.7.56	Walberswick : 52°18'N. 1°41'E. (Suffolk) DBC
v		18.11.56	Bradwell-on-Sea (Essex) 46m. S.W.

**Snow Bunting** (*Plectrophenax nivalis*)

62245	1stW. ♀	31.10.55	Fair Isle : 59°32'N. 1°37'W. (Shetland)
v		28.1.56	Spurn Point (Yorkshire) 415m. S.S.E.
69477	ad. ♀	30.12.55	Spurn Point : 53°35'N. 0°06'E. (Yorkshire)
v		28.11.56	le Zoute : 51°21'N. 3°19'E., Knokke (West Flanders)
			<b>Belgium</b>
		11.12.56	<i>ibid</i>
×		ca.17.3.57	Markle : 55°59'N. 2°40'W., East Linton (East Lothian)
77711	ad. ♂	29.1.56	Spurn Point
×		(10.3.56)	Gibraltar Point : (Lincolnshire) 34m. S.S.E.

**House Sparrow** (*Passer domesticus*)

69431	ad. ♂	4.3.56	Spurn Point : 53°35'N. 0°06'E. (Yorkshire)
×		23.3.56	Nunkeeling, <i>nr.</i> Driffeld (Yorkshire) 27m. N.N.W.
69463	ad. ♀	30.12.55	Spurn Point
×		(10.3.56)	Paull, <i>nr.</i> Hull (Yorkshire) 16m. W.N.W.
69458	ad. ♂	30.12.55	Spurn Point
×		9.7.56	Hilston (Yorkshire) 14m. N.W.
IJ546	ad.	22.3.52	Flixton : 53°33'N. 2°37'W. (Lancashire) AEM
×		(12.1.56)	Lower Ince, <i>nr.</i> Wigan (Lancashire) 11m. N.W.

**Corrigenda to Reports for 1954 and 1955****1954 Report** (*British Birds*, vol. xlviii, p. 494)**Whitethroat** (*Sylvia communis*)

KF715	O pull	14.6.52	Kilrenny : 56°14'N. 2°41'W. (Fife) WJE
v		12.5.54	Isle of May (Fife) 7m. S.E.

**Willow Warbler** (*Phylloscopus trochilus*)

L304	f.g.	3.9.53	Isle of May : 56°11'N. 2°33'W. (Fife)
×		12.5.54	Thurso (Caithness) 170m. N.N.W.

**1955 Report** (*British Birds*, vol. l, p. 60)**Black-headed Gull** (*Larus ridibundus*)

78662	O pull	19.6.55	Lough Derg : ca.52°55'N. 8°20'W. (Tipperary) DFC
×		(3.9.55)	<i>Nr.</i> Carrick-on-Suir (Tipperary) 50m. S.E.

# PHOTOGRAPHIC STUDIES OF SOME LESS FAMILIAR BIRDS

## LXXXIV. EAGLE OWL

Photographed by KURT ELLSTRÖM and ENAR SJÖBERG

(Plates 65-68)

Text by KAI CURRY-LINDAHL

THE EAGLE OWL (*Bubo bubo*) was formerly distributed over most of Europe, though there is no evidence of its ever having bred in Great Britain and Holland during historical times. To-day, however, it has greatly diminished in numbers and is still decreasing in most countries of western and central Europe.

In Norway the species is found sparsely in the southern parts, but in the north it is rare, though it has been recorded breeding in several places north of 69°N. in the county of Tromsö (Barth, 1953; Munthe Kaas-Lund, 1955). During the major part of the 19th century this owl was common throughout the whole of Sweden, but towards the end of the century the decrease started. Nowadays the Eagle Owl is totally extinct in several provinces of southern and central Sweden, where it was quite common only 30 years ago. A census, carried out during the years 1943-1948, indicated that there were at least 291 breeding pairs in Sweden, but of these 84.5% were in the northern forests of the country (Curry-Lindahl, 1950). Similarly in Finland the species has markedly decreased, though it is still distributed over almost the whole country, particularly in the north; Merikallio (1955) estimated its numbers to be about 300 pairs. In Denmark this bird has not bred since 1891 (Jespersen, 1946) and has probably been extinct since 1893 (Hvass, 1947). In Belgium, where in 1928 several pairs were breeding in the south-eastern parts (van Havre, 1928), there has been no record of an Eagle Owl since 1937 (d'Artet, 1948). In 1953 the population in Germany was estimated at about 65 pairs (März, 1953); four years later, Mebs (1957) gave a figure of about 70 pairs, of which more than half were breeding within the boundaries of the province of Bavaria. About ten years ago the species still existed in small numbers in various mountain zones of France (Curry-Lindahl, 1950); and, according to N. Mayaud (*in litt.*), the Spanish race (*B. b. hispanus*) is also to be found in French territory, in the eastern parts of the Pyrenees, while *B. b. bubo* occurs in the western part of the same mountains. At the end of the 1940's the numbers of breeding Eagle Owls in Switzerland and Austria were estimated to be at least 10 pairs and about 50 pairs respectively (Curry-Lindahl, 1950). From Italy it is reported still to occur rarely in the Alps and Apennines (Caterini and Ugolini, 1953).

All these figures show a pronounced decline of the species in western Europe. In the eastern countries of the continent, however, its status is more satisfactory. Nevertheless, the population is decreasing there as well, although the process seems to be much slower than in western Europe. This is probably due to the existence in eastern Europe of relatively large undisturbed areas, where Eagle Owls may find protection. A survey of the species' occurrence in eastern Europe is given in another paper (Curry-Lindahl, 1950).

The principal cause of the decrease of the Eagle Owl in Sweden has been, and still is, the relentless hunting of these birds throughout the centuries: every year many eggs have been destroyed by hunters or taken by collectors, many nestlings have been caught or killed, and the adults have been shot or constantly disturbed. This severe treatment is to some extent explained by the fact that this owl has always been considered, by hunters and game-keepers, to be a very destructive bird as far as game animals are concerned. The juveniles, however, are captured for other reasons; they are reared in captivity and sold as living decoys to be used in the hunting of crows and raptorial birds. A further reason for the disappearance of the Eagle Owl is the transformation of its biotopes as a result of advancing cultivation. Though the species seems to tolerate human neighbours and can accustom itself to the fact that the forests of its breeding territories are being cultivated and changed, it cannot stand disturbance during the breeding-season. If the bird is frequently disturbed near its nest, it abandons eggs and nestlings.

The Eagle Owl in Sweden is a bird of wooded mountains, rocky woods, and cliffs in the archipelagoes. In other parts of Europe there are examples of quite different habitats. As a rule, every breeding pair alternates between two, three or four nesting-places in its territory. In southern Sweden this owl has a full clutch at the end of March or at the beginning of April; and it is about a month later in northern Lapland. The Swedish Eagle Owls generally lay three eggs, but very often one of the youngsters dies and only two juveniles grow up. The numbers of eggs or nestlings in the various Swedish clutches and broods known to the author are given below. Many sources of error (incomplete clutches, disappearance of nestlings, and so on) may, however, be involved in these figures.

Numbers of eggs or nestlings	1	2	3	4	5	6
Number of clutches	7	56	41	12	0	3

The incubation period is 35 days, and the female starts to sit regularly once two eggs have been laid, as we have observed at Skansen, the Zoological Garden of Stockholm.

In Sweden the species is sedentary and, except for the general trend towards a gradual decrease, no occasional or regular



fluctuations in the population are known to occur there, though observed in many other kinds of raptorial birds. In Russia, however, variations in numbers of *B. bubo* have been noted; these according to H. Johansen (*in litt.*), correspond to fluctuations among the animals that form the prey of the Eagle Owl. In Canada a near relative, the Great Horned Owl (*B. virginianus*), shows an extraordinarily regular 10-year periodicity (Speirs, 1939).

A Swedish investigation (Curry-Lindahl, 1950) into the food of *B. bubo* shows clearly that small rodents form the main part with 42%. First among the recorded food items comes the Brown Rat (*Rattus norvegicus*) with 86 specimens, then the Hooded Crow (*Corvus corone cornix*) with 45, the vole-rat *Arvicola terrestris* with 38 and so on. It is remarkable that Brown Rats are caught by Eagle Owls with such frequency, because these rodents in general occur only around human settlements. In fact, in northern Sweden such a prey must be hunted regularly in the close vicinity of buildings. It is true that *Rattus norvegicus* may extend its range away from the proximity of buildings during the summer, but such movements probably occur only in southern Sweden. The food of the Eagle Owl, according to the Swedish figures, consists of 55% mammals, 33% birds, 11% fishes, and 1% reptiles and amphibians. Insects and crustaceans, though also sometimes taken by this owl, were not taken into account in the Swedish samples.

Though some individuals may specialize on certain prey, the species in general shows a wide range of food selection. There is a recorded case in Germany of an Eagle Owl killing a Roe Deer (*Capreolus capreolus*), whose weight was 13 kilograms (approximately 28½ lbs.) (Meise, 1936). This is the largest recorded prey known to the author. At the other end of the scale there is an interesting case of unusual specialization in Switzerland, where 2,397 bones of the European Frog (*Rana temporaria*) were found in pellets from an Eagle Owl's territory (Géroudet and Robert, 1940). Generally speaking, however, the dominance of small rodents in the food of the Eagle Owl in Sweden corresponds very closely to similar investigations which have been carried out in other European countries (Moltoni, 1939; Uttendörfer, 1939, 1952; Burnier and Hainard, 1948; Hagen, 1952; März, 1953).

Incidentally, the Eagle Owl that appears in the flash-photographs (plates 65-68) taken by Messrs. Ellström and Sjöberg was typical in that it fed its offspring chiefly with Brown Rats. This particular nest was situated on a rocky shelf of a mountain in the forests of Hälsingland, a province of central Sweden.

Apart from giving an indication of the characteristic size of the Eagle Owl, largest of all European owls, these plates bring out some of the distinguishing features of this species. The ear-tufts on the broad and heavy head are visible on plates 66-68, in spite of the fact that they are not raised in any of them. The broadly streaked tawny-buff breast is well shown in every case, and plates

67 and 68 illustrate the mottled black and tawny upper-parts. Only colour photographs, however, can do full justice to the burning, orange eyes of this owl. Plate 65 shows the female alighting on the nest rock at 10.10 p.m. and one can see how the large head is characteristic even in flight. In spite of its size the bird flies noiselessly through the thick forests. Sometimes, however, the wings produce a rustling sound when the bird sweeps in with feathers touching the branches of an old, spreading Norway Spruce (*Picea abies*).

It is very difficult to sex Eagle Owls. Males are in general smaller than females, but this does not always hold good. Similarly, the whitish upper throat may be larger in the male than in the female, but this is also an uncertain character. The voice is much too variable in both sexes to give any help outside the breeding-season.

Even in autumn Eagle Owls may be heard calling at dusk, although regular calling does not start before February and March (in Sweden). In fact, I have heard *B. bubo* calling in every month of the year, as is also the case with the Tawny Owl (*Strix aluco*). The male Eagle Owl has several favourite perches, from which he calls. The display ceremony preceding mating is seldom seen, but the sexual activities may be interpreted by the series of loud, different announcements of what is going on.

The voice of the Eagle Owl is well developed and variable, and is not a simple affair to describe. There are many more sound expressions of this species recorded in my note-books than there is place to analyse in a short article of this kind. It is also a difficult task to interpret and understand the meaning and the psychological background of the Eagle Owl's rich vocabulary in different situations. Here lies an open field of research for ethologists!

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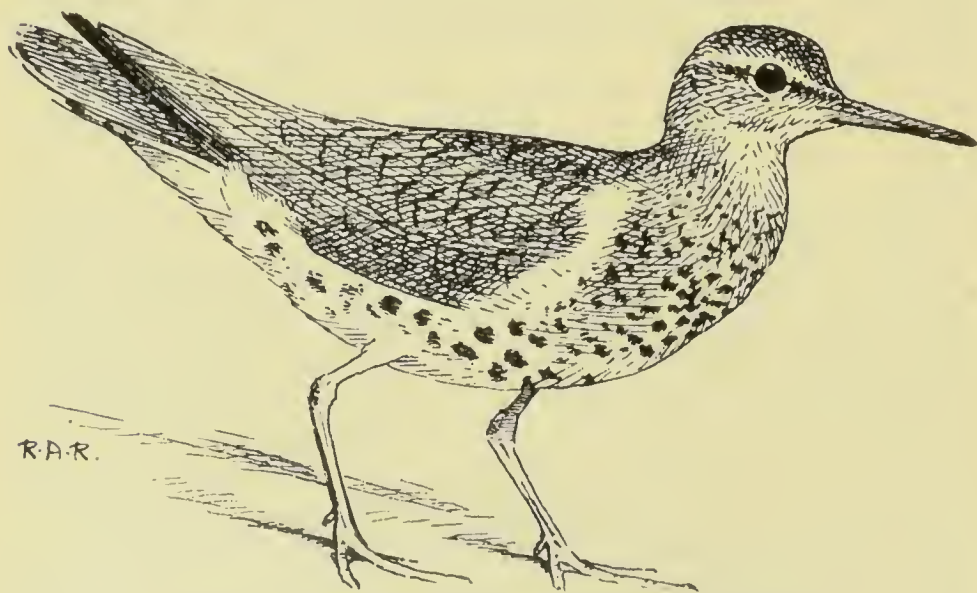
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## NOTES

**Spotted Sandpiper in Norfolk.**—On 7th June 1957, I was making my daily round of the Norfolk Naturalists' Trust marshes at Cley, Norfolk, of which I am the Warden, when I saw on the wing what appeared to be a Common Sandpiper (*Tringa hypoleucos*).

A little later I again saw the bird, which had by then settled on the edge of a marshy pool, and I was immediately struck by the fact it had large round blackish spots on the breast and flanks; also that it had a conspicuous white eye-stripe. The legs were dull straw coloured and the proximal part of the bill was dull orange, while the distal portion was very dark brown. The wing pattern in flight did not appear to differ appreciably from that of a Common Sandpiper. The call was not unlike that of a Common Sandpiper, but from time to time the bird made a double note "peet-weet".



SPOTTED SANDPIPER (*Tringa hypoleucos macularia*)  
 CLEY, NORFOLK: 7TH-8TH JUNE 1957  
 (Drawn by R. A. Richardson)



It was immediately obvious that it was a Spotted Sandpiper (*T. h. macularia*) in summer plumage. Subsequently I had it under observation for a considerable period at distances down to 10 yards or less. On 8th June it was seen by Mrs. R. F. Meiklejohn, R. A. Richardson (whose sketch is here reproduced), H. Hunt and A. H. Daukes and by many other observers.

This appears to be the first record for Norfolk. W. F. BISHOP

[In the First Report of the present Taxonomic Sub-committee of the British Ornithologists' Union, published in January 1956 (*Ibis*, vol. 98, pp. 157-168), the Common and Spotted Sandpipers are regarded as conspecific, so that the latter now becomes *Tringa hypoleucos macularia*, the American race of a species that extends right across Europe, Asia and North America.—EDS.]

**Ringed Plover breeding in Hertfordshire.**—On 19th May 1957, T.W.G. and B.L.S. visited Rye Meads sewage farm, Hertfordshire, and saw, amongst other waders that were present, three Ringed Plover (*Charadrius hiaticula*). Both these observers and J.M.V. visited this locality many times during May, June, and July, and on most occasions a pair of Ringed Plover was noted in the area. From the behaviour of this pair B.L.S. came to the conclusion that they were breeding. A search was made for the nest by T.W.G. and J.M.V., but it was not located. Definite evidence that the birds had bred was obtained, however, on 21st July, when both these observers saw the adults with two young birds that were still incapable of flight; one of the young was caught and examined. The young were also seen by B.L.S. on 24th July, when they were being brooded by one of the adults. They appeared to be about three weeks old as they were nearly fully fledged, so, accepting the incubation period as being 24-25 days, it would appear that the eggs were laid during the first week of June. This is consistent with the behaviour of the birds.

This is the first record of the breeding of the Ringed Plover in Hertfordshire, and the second instance for the London Area (i.e. within 20 miles of St. Paul's Cathedral) the first being near Enfield, Middlesex, in 1901 (*Zoologist*, vol. 59, p. 389).

BRYAN L. SAGE, T. W. GLADWIN and J. M. VAUGHAN

**Blackbirds building unusually large nests.**—In 1928, on a farm near Rochester, Kent, I found a Blackbird's (*Turdus merula*) nest in one of several wigwam-shaped stacks of disused hop-poles in a secluded corner. The poles were about twelve feet in length, and so smooth that the nesting materials had slipped down the chosen crevice to a lower level than the birds desired, with the result that building had been continued until there was a nest about two feet in height, with a normal cup at about four to five feet above ground level. Similar nests were found in other stacks of poles in the next two years, which suggests the possibility of a common builder.

R. D. ENGLISH

**Robins rearing two broods in an unusual "screened" nest.**— On 8th March 1957, in a garden at Malvern, Worcestershire, I found that a pair of Robins (*Erithacus rubecula*) were using the same nest-site in which a brood of five had been safely reared in 1956. This was 3½ feet above the ground, in a hollow in a pollarded chestnut trunk covered with clematis. A curious feature was that a "screen" of dead leaves was built in front of the site, hiding the nest; this screen was 7½ inches in width and 3 inches high, constructed mostly of whole dead leaves of copper beech. The birds were much in evidence, but the nest itself had not been started on 19th March, though it was complete by the 26th. This was a typical moss structure, with the usual foundation of dead leaves, and lined with cattle and horse hair (the site being opposite a farmyard gate). The first egg was laid on the 28th, the fifth and last on 1st April. The fledglings were still in the nest on 26th April, but had flown when I visited the site on the 30th.

I have seen no records of Robins rearing two broods in the same nest and I was therefore very surprised on 14th May, when looking at a Blackbird's (*Turdus merula*) nest in the same tree, to find three eggs in the Robin's nest. This time six eggs were laid and six young eventually left the nest safely.

Dr. David Laek, in his book *The Life of the Robin* (1943, pp. 83-84), mentions that, in the nest of this species, dead leaves are normally used as a foundation, but not elsewhere. He does, however, quote a rather questionable statement of William Turner's, who, writing in 1544, described how he had observed, when he was very young, that the Robin "builds a long porch of leaves before the aperture" of its nest. Laek also refers to a few observations of the present century, which between them cover the essentials of Turner's record and include a case of a Robin's nest with a dome and another in which a tunnel to the nest was lined with dead hawthorn leaves (when the nest is placed in a hole or in grass on a bank, there is sometimes the appearance of a tunnel to it in front). But there seems to be no record of a screen of leaves built up in front of the nest, such as I found, nor was there any screen at the same site in 1956. M. PALMER-SMITH

## REVIEWS

**VOICES OF THE WILD.** By ERIC SIMMS. (Putnam, London, 1957). 230 pages; 18 photographs. 21s.

"VOICES OF THE WILD" is an interesting and enjoyable account of the bird and animal recording work which Eric Simms, with recording engineer Bob Wade, has carried out for the B.B.C. since 1951, when Ludwig Koeh left the Corporation. In style, the book resembles a good one by a bird-photographer, but Eric Simms is more modest than are some photographers about the difficulties and frustrations which his work involves. The bird-song recorder does not need to be closeted for hours in a hide. On the other hand, he must habitually be up before the lark;

he is even more at the mercy of the weather than is the photographer; and in a country as small as Britain extraneous noise is a continual hazard. But he has the great advantage that he can immediately play back and assess his results; he is saved the agony which photographers suffer before they reach the dark room. Indeed, he can play back in the field to the performers themselves and it would have been interesting to have been told more about the reactions of birds to their own voices. Unfortunately, however, Eric Simms is unable to interleave his recordings in the pages of his book and it is somewhat of an anomaly that he should have to describe bird calls phonetically—a baffling method at all times and especially so when such (surely) different sounds as the flight calls of the Bittern and the Shelduck are described in exactly the same words, “ark . . . ark . . . ark” (pp. 62 and 63).

The chapters of “Voices of the Wild” each describe an expedition, or series of expeditions, to record a particular species or the bird or animal sounds of a particular habitat or country. Among the places visited are East Anglia, the Spey Valley, the Camargue and Spain. Badgers, Little Ringed Plovers and Stone Curlews each have a chapter to themselves, which describe, very modestly, the recording of almost the entire vocabulary of these species. The final chapter deals with the technique of nature recording; the only new development since the very full description given in these pages by Simms and Wade in 1953 (*antea*, vol. xlv, pp. 200-210) is in the use of a light-weight radio-transmitter and receiver which has been found useful for recording from places, such as lighthouse balconies, where microphone cables would be impracticable.

The primary purpose of the recordings is for use in broadcasting, but copies have been presented to the British Trust for Ornithology at Oxford and the Department of Zoology at Cambridge, where they are available for serious study; it is also intended to deposit copies at the British Institute for Recorded Sound. Anyone who has heard the recordings must regret that they are not on sale to the general public, as are the nature recordings of some other countries. E. R. PARRINDER

**WILD AMERICA.** By ROGER TORY PETERSON and JAMES FISHER. (Collins, London, 1956). 416 pages; many illustrations. 30s.

WHEN two highly qualified naturalists collaborate to produce a book, and when both are top-flight writers, one has a pleasurable expectation that they will present something out of the ordinary. *Wild America* fulfils this promise in ample measure. Its subject matter is of the highest technical excellence and the happy formula adopted, whereby the joint authors wrote alternate chapters, enhances rather than interrupts the flow of the narrative. It is always interesting to see one's own country through another's eyes. Roger Peterson's invitation to show James Fisher the wild-



life of North America in the course of a 25,000 miles pilgrimage, from Newfoundland to Alaska and the Pribilof Islands by way of Florida and Mexico, was an ambitious venture which succeeded admirably. Peterson was, of course, revisiting country with which he was already largely familiar and he exhibited it with infectious delight. To James Fisher everything was new and his impressions are vividly written, with an expertly critical eye to Old World equivalents in fauna and geography. The fact that Peterson has travelled extensively in Europe resulted in many stimulating discussions on the similarities and differences between the bird life of the two continents. The increasing awareness among British ornithologists that one third of Europe's birds are conspecific with the North American, and the frequent occurrence of American species in Britain, increase the appeal of this book. It is the best introduction to American bird life, from the viewpoint of Europe, yet written and is an admirable companion to the film of the same name which has now been seen by millions in this country.

Although the primary interest of both authors was ornithological, there is something for every naturalist in this book, whether his leaning is towards birds, beasts, insects, botany, marine life, geology, or ethnology, for all these subjects are embraced. The long itinerary covered a fully representative cross-section of the amazingly varied geography of the continent, with its great deserts, mountains, prairies, lakes, islands, reefs, tundra, forests and jungles. These and their dependent fauna are described with a refreshing absence of the horrible "travelogue" technique which so often ruins works of this kind. Indeed some of the more thoughtful passages would merit honourable mention in any anthology of natural history.

James Fisher embraced American ornithology with his customary enthusiasm and eye for detail. He proved a willing victim to the transatlantic cult of the "life-list". To such a degree that, for the first time in recorded history, an Englishman succeeded in breaking by a large margin and holding for three weeks the national annual record, by observing no fewer than 601 different species of American birds in the course of his journey.

It was courageous of the authors of *Wild America* to resist the temptation to illustrate their book with photographs, more particularly as Peterson is a consummate artist with his camera. The British public is familiar with his draughtsmanship in the illustrations of the *Field Guide to the Birds of Europe*, which, like their counterparts in the equivalent American guides, have set a new standard of accuracy in bird portraiture. In *Wild America*, freed of the shackles of exact portraiture which are necessarily required in works of identification, he has shown us his true sense of uninhibited artistry. The collection of scraper-board illustrations of birds, mammals, reptiles, flowers and scenery sacrifice nothing of his customary accuracy of detail and posture, but are full of life and atmosphere. They add enormously to the value of this excellent book.

G.M.

## REQUESTS FOR INFORMATION

**Widespread irruptions of Blue Tits and other species.**—About the middle of September 1957 a remarkable movement of Blue Tits (*Parus caeruleus*) and certain other species started in south-east England. Between then and the time of writing (third week of October) this movement has been noted in many coastal districts and some inland ones in a number of counties, but particularly in East Anglia and along the South Coast, in the Irish Sea area, and in Cheshire and Lancashire. In most areas the Blue Tit is easily the dominant species, but there have also been smaller numbers of Coal Tits (*P. ater*) and Great Tits (*P. major*), considerable flocks of Tree Sparrows (*Passer montanus*), Redpolls (*Carduelis flammea*) and Siskins (*C. spinus*), many Goldcrests (*Regulus regulus*) and (in the south only) some Firecrests (*R. ignicapillus*), and also Dunnocks (*Prunella modularis*), Wrens (*Troglodytes troglodytes*), Treecreepers (*Certhia familiaris*) and Great Spotted Woodpeckers (*Dendrocopos major*). A few Jays (*Garrulus glandarius*) have been seen coming in off the sea and an astonishing concentration of 1,000 of this species was noted in Essex. In other areas, movements of small, dark Song Thrushes (*Turdus philomelos*), Reed Buntings (*Emberiza schoeniclus*) and Yellowhammers (*E. citrinella*) are commented on.

Among the birds trapped at observatories, individuals of Continental races of Blue, Great and Coal Tits have been identified, while the Redpolls appear all to be *C. f. cabaret* (or *disruptis*). On the other hand, a number of typical British Blue, Great and Coal Tits have been examined, and the onset of the irruption is to some extent obscured by the considerable dispersal, again originally in south-east England, of apparently local tits, during August and the first half of September. The suggestion at the moment is that at least some of the birds since mid-September are of central European origin, and it seems certain, from information received from Dr. G. Svårdson and others, that Scandinavian populations are not involved—except that a most interesting irruption of Treecreepers is reported from Sweden and parties of Jays have also been on the move in that country.

It is clear that we must try to form as full as possible a picture of these interesting irruptions, and Messrs. A. Pettet and J. T. R. Sharrock have agreed to collect and analyse the data, with a view to preparing a report for publication. We ask that all those who have made relevant observations should get in touch with them at the Botany Department, University of Southampton. Data required are any observations suggesting unusual arrivals or passages of these species (and also of any other birds that may seem connected), but particularly, where possible, details of the numbers involved, *times* and directions of movement, etc. Negative records would also be useful; information on dates and times when various places were watched is important in establishing the complete picture. Any records (with details of determination) of Continental forms trapped during recent weeks or during the coming winter would also be of interest.

**The abnormal breeding-season of 1957.**—The start of the breeding-season of 1957 was abnormal in that quite a number of species nested exceptionally early, while some were only a little early and others at the usual time. Dr. David Lack is preparing an analysis for us and we invite readers to send all relevant records and comments to him at the Edward Grey Institute of Field Ornithology, Botanic Garden, Oxford. He would like to receive all records of unusually early nests, and if a series of nests of one species were found, some early and others not, details of all would be useful. If anyone has comparisons with the same area in previous years he is asked to say so, and records from those who keep regular notes on all nests found will be particularly welcome. Please give as full information as possible to enable

the date of laying to be established for each nest, e.g. whether found with clutch incomplete, or the date the young hatched or flew. Information is also wanted on the fate of unusually early nests, where known, though not for nests at the usual season. The enquiry covers all regular breeding species, but particularly those which normally breed in March and April. Dr. Lack will be extracting details from the Nest Record cards of the British Trust for Ornithology, so that there is no need to repeat details of nests already reported in this way.

**The "wreck" of Kittiwakes in the early part of 1957.**—During the early months of 1957 large numbers of Kittiwakes (*Rissa tridactyla*) were found on shores and inland, particularly in western districts of England and Wales. Many of these birds appeared to be in ill-health and later died. Miss L. McCartan has been collecting observations on this "wreck" and has nearly completed a report on the subject for publication. We should be grateful if any information about these flocks of Kittiwakes, together with details of their numbers, length of stay and behaviour, could be sent to Miss McCartan at the Department of Zoology, University College of Wales, Cambrian Street, Aberystwyth. She would also be particularly glad to have details of any dead or dying Kittiwakes found, and of any post-mortem examinations which were carried out on them.

**The Waxwing invasion of February and March 1957.**—In our August issue (*antea*, p. 339) we referred briefly to the sizeable invasion of Waxwings (*Bombycilla garrulus*) which occurred in the eastern counties of Scotland and England during the latter part of February and the beginning of March 1957. It seems evident that the numbers involved were the largest to reach the British Isles since the big invasion during the winter of 1946-47 (*antea*, vol. xli, pp. 2-9 and 34-40) and we have therefore asked Mr. R. K. Cornwallis if he would prepare a summary and analysis of the records. We would be grateful if all records that for any reason are not being reported to the editor of a county bird report could be sent to him at Bleasby Grange, Legsby, Market Rasen, Lincolnshire; particularly does this apply to Scottish records.

Many readers will remember, from the previous reference to this invasion, that these birds were thought to be the overflow of a far larger immigration into Scandinavia, which was halted by the plentiful supplies of berries that were available there. In his paper on "The 'invasion' type of bird migration", Dr. G. Svårdson made the forecast (*antea*, p. 339) that there would be a large-scale Waxwing movement outside Scandinavia in the autumn of 1957. It is therefore of interest to add that in a recent letter (dated 17th October) Dr. Svårdson wrote to say that in the previous few days it had become clear that a Waxwing movement was already starting in Scandinavia. Flocks had been observed moving south and, as the berry crop "is roughly 5 per cent of that of last year", it seems likely that the birds will not delay in Sweden. Those moving along the west coast of Scandinavia may well result in another irruption in Britain by the time this issue is published.

**The irruption of Crossbills in the autumn of 1956 and breeding in 1957.**—The invasion of Crossbills (*Loxia curvirostra*) in the autumn of 1956, though not as large as the 1953 one (*antea*, vol. xlix, pp. 289-297), resulted in rather more cases of breeding in the spring of 1957. Mr. F. R. Smith has therefore agreed to prepare a report for publication and we ask that records of Crossbills in the autumn of 1956 and the spring of 1957 should be sent to him at Telford, Hill Barton Road, Exeter, Devon, unless they have already been passed to the editor of a county bird report.

PURCHASED  
14 NOV 1957





## NOTICE TO CONTRIBUTORS

*British Birds* publishes material dealing with original observations on the birds of Britain and Western Europe, or, where appropriate, on birds of this area as observed in other parts of their range. Except for records of rarities, Papers and Notes are normally accepted only on condition that the material is not being offered to any other journal. Photographs (glossy prints showing good contrast) and sketches are welcomed. Proofs of all contributions accepted are sent to authors before publication. After publication 20 separates of Papers are sent free to authors; additional copies, for which a charge is made, can be provided if ordered when the proofs are returned.

Contributors are asked to observe the following points, attention to which saves the waste of much editorial time on trivial alterations:

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3. Certain conventions of style and lay-out are essential to preserve the uniformity of any publication. Authors of Papers in particular, especially of those containing Systematic Lists, Reference Lists, Tables, etc., should consult the ones in this issue as a guide to general presentation. English names of species should have capital initials for each word, except after a hyphen (e.g. Siberian Thrush, Yellow-headed Wagtail), but group terms should not (e.g. thrushes, wagtails). English names are those used in *The Handbook of British Birds*, with the exception of the changes listed in *British Birds* in 1953 (vol. xlii, pp. 2-3). The scientific name of each species should be given (in brackets and underlined) immediately after the first mention of the English name. Sub-specific names should not be used except where they are relevant to the discussion. It is sometimes more convenient to list scientific names in an appendix. Dates should take the form "1st January 1955" and no other, except in Tables where they may be abbreviated to "1st Jan.", "Jan. 1st", or even "Jan. 1", whichever most suits the lay-out of the Table concerned. It is particularly requested that authors should pay attention to Reference Lists, which otherwise cause much unnecessary work. These should take the following form:

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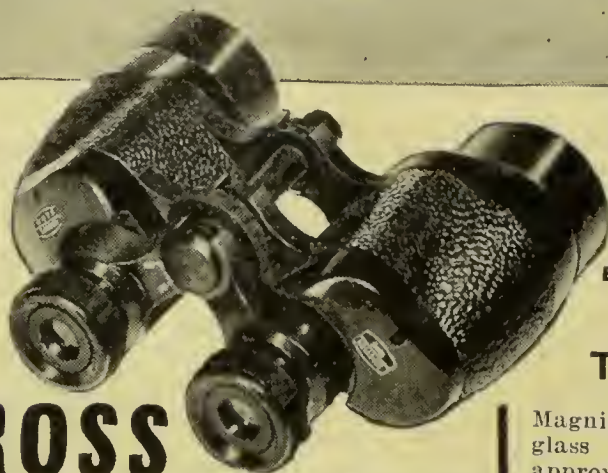
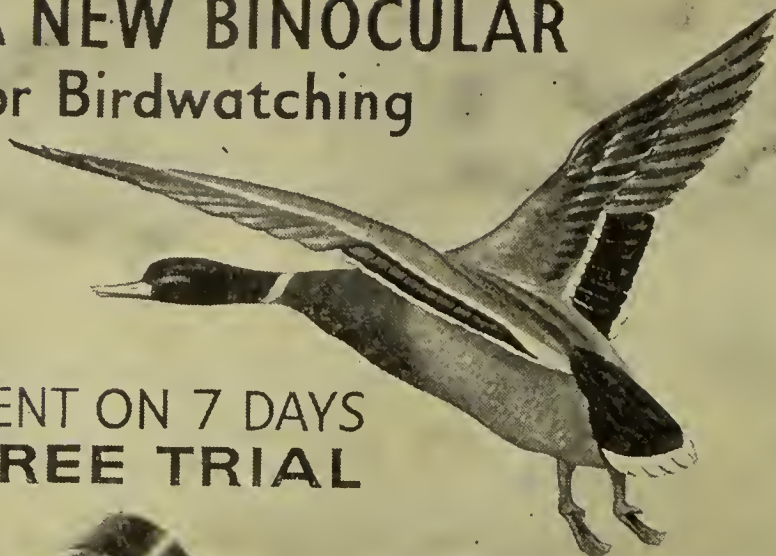
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# BRITISH BIRDS



DECEMBER 1957

THREE SHILLINGS



# BRITISH BIRDS

AN ILLUSTRATED MONTHLY MAGAZINE

Edited by

E. M. NICHOLSON

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## CONTENTS OF VOLUME L, NUMBER 12, DECEMBER 1957

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	PAGE
The Camargue and the Coto Doñana. By E. M. Nicholson, I. J. Ferguson-Lees and P. A. D. Hollom. Photographs by Eric Hosking and G. K. Yeates (plates 69-80) ... ..	497
Migrations of the Oystercatcher in the area of Britain: results of ringing. By E. J. M. Buxton ... ..	519
Icelandic Black-tailed Godwits wintering in Ireland. By Kenneth Williamson and Major Robert F. Rutledge ... ..	524
Observations on broods of Nuthatches leaving the nest. By Dr. M. C. Radford ... ..	526
Some observations on birds in the North Atlantic. By Hugh Idris Jones	528
Further Partridge records from Wales. By Colin Matheson ... ..	534
Notes:—	
Gannets robbing gulls (J. E. Flynn) ... ..	537
Green Sandpiper uttering call of Wood Sandpiper (A. D. Townsend)	537
A feeding method of Black Tern (R. Angles) ... ..	538
Display and posturing of the Cuckoo (W. G. Luton) ... ..	538
Reviews:—	
<i>Britain's Nature Reserves</i> . By E. M. Nicholson ... ..	538
<i>The Birds of the British Isles</i> . By D. A. Bannerman. Illustrated by G. E. Lodge. Vol. V ... ..	539
Letters:—	
"Science and the bird-watcher" (Chas. H. Cooke; Michael Rayner; D. Bicknell; W. N. A. Thompson) ... ..	540
Requests for Information:—	
Irruptions of tits and other species (A. Pettet, J. T. R. Sharrock and Stanley Cramp) ... ..	542
The status of the Red-crested Pochard in the British Isles (G. A. Pyman) ... ..	543
Waxwings in November 1957 (R. K. Cornwallis) ... ..	543
Phalaropes in the autumn of 1957 (Bryan L. Sage and Bernard King)	543
A "wreck" of Little Auks? (the Editors) ... ..	543
The increased wintering by Ruffs during 1954-57 (Bryan L. Sage) ...	544
Review: Calendars and Christmas Cards ... ..	544

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Cover photograph by Eric Hosking: White Storks (*Ciconia ciconia*) at nest, Coto Doñana, Spain

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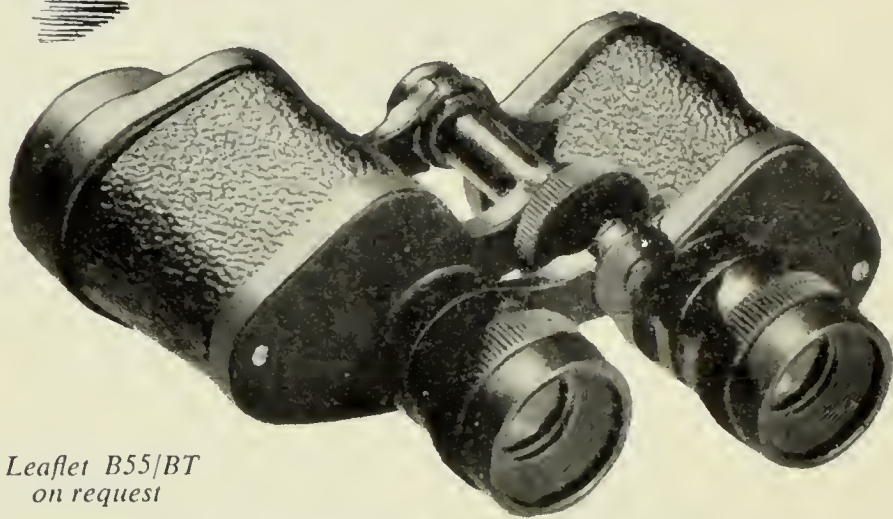
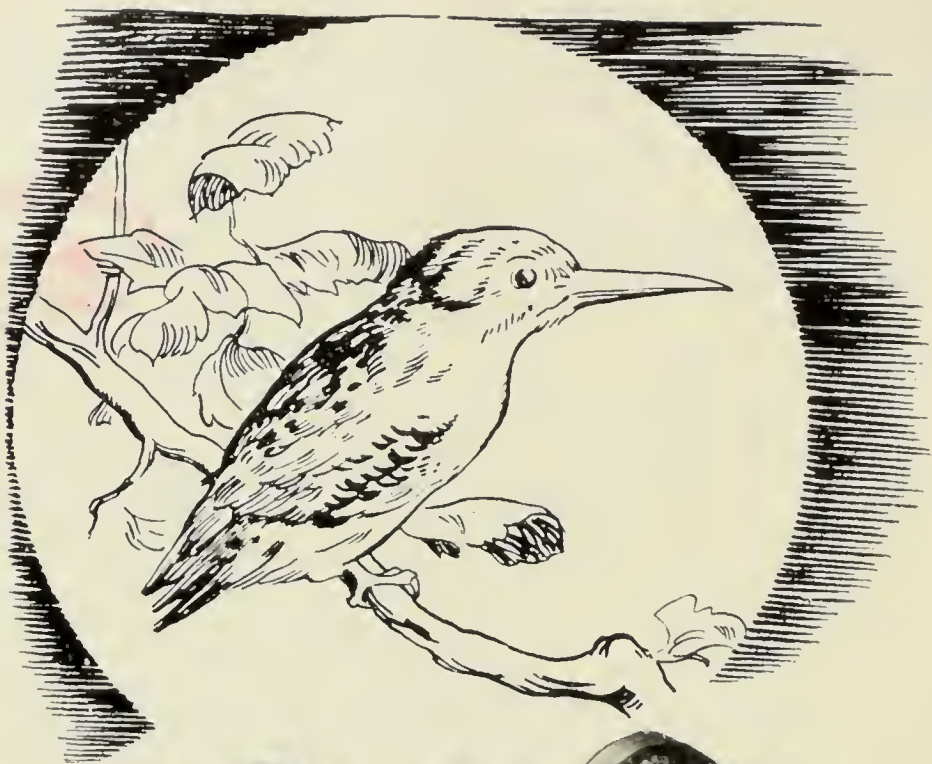
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## BRITISH BIRDS

### THE CAMARGUE AND THE COTO DONANA

By E. M. NICHOLSON, I. J. FERGUSON-LEES and P. A. D. HOLLOM

(Plates 69-80)

AMONG the coastal regions of south-west Europe, two are outstanding for the wealth of their bird life and as surviving fragments, on a grand scale, of habitats which have largely been destroyed elsewhere. These are generally, although loosely, known as the Camargue and the Coto Doñana, the first being in southern France and the second in south-west Spain. Both have recently been investigated much more thoroughly than in the past and it has become possible, as a result of much patient work by many naturalists of different countries, to make some tentative comparisons between them.

As will be seen from the maps on pages 506-507 and 508-509, the Camargue strictly includes only the large island that lies between the Grand and Petit Rhônes and the Mediterranean. However, for ornithological purposes it is often convenient to let the term stand for a wider "Camargue region" including the similar and often equally favourable marshland and waters westwards from the Petit Rhône, embracing the Petite Camargue and beyond as far as Aigues-Mortes, and on the opposite side the stony Crau desert, east of the Grand Rhône (see page 499).

Similarly, the modern Coto Doñana estate, or even the rather larger previous one, covers only part of the immense sand-dunes of Arenas Gordas, and only a fragment of the vast *marismas*, or marshes, of the Guadalquivir delta. This delta extends in all over about 740 square miles, including probably some 620 square miles of *marismas*, which are flooded in every normal winter and spring, and about 120 square miles of coastal sand-dunes. Some idea of the vast extent of the delta can be got if one thinks of it as approximating to Surrey or Berkshire in size.

The wider "Camargue region", as above defined, is nearly as extensive, and has much the same length of sea-coast; but, as the

map shows, it is a shallow oblong rather than an acute triangle. The Camargue proper covers only about 293 square miles, of which 55 square miles are lakes and a rather larger area swamps.

These rough definitions should be borne in mind, in reading what follows. The context will show where the wider or the stricter applications of the terms "Camargue" or "Coto" are applicable (when the distinction matters). Where the expression "Coto and *marismas*" is used, it signifies the entire Guadalquivir delta, excluding the reclaimed areas towards Seville and towards Huelva.

Although both belong to southern Europe it is not always realized how much more southerly the Coto is than the Camargue. The Camargue is north of Latitude  $43^{\circ}$  and therefore as northerly as Niagara Falls or Vladivostok, but the Coto is five hundred miles nearer the Equator on Latitude  $37^{\circ}$ , which also intersects northern Iraq and touches Arizona. Equally important is the far westerly situation of the Coto, lying due south of the Faeroes and the Isles of Scilly on the edge of Europe, whereas the Camargue lies on a line drawn south through Bergen and Antwerp.

Geographically, therefore, the Camargue is more purely Mediterranean, while the Coto is more African but also more Oceanic, exposed in winter and spring to south-westerly winds from the Atlantic, instead of the northerly *mistral* from the mountains behind, which is characteristic of the Camargue.

Although winters in the Camargue are generally mild, short frosty spells are not infrequent and calamitous icy periods such as those of early 1917 and 1956 can last for three weeks or longer. There is a mean annual temperature of 57-58 degrees Fahrenheit and a range of more than 30 degrees over most of the Camargue. Summer rainfall is low—June and July combined yielding less than one inch in places—but the annual rainfall exceeds 20 inches, which is little short of London's. This total, however, is largely due to the heavy rains during October and November, which result in the winter flooding. There are, indeed, some three hundred rainless days annually, and less than forty on which the sky is as much as three-quarters clouded; at all times mist or fog is rare. The evaporation is correspondingly rapid, being equivalent to nearly five feet annually at Salin de Giraud.

In the area of the Guadalquivir delta, winter temperatures rarely drop below 42 degrees, and even during cold spells frost is normal only for short periods in the early mornings. The snow of January 1954 was the first heavy fall for over seventy years. Summer temperatures can rise well above 100 degrees, a level which in the Camargue is exceeded on about four or five days in really hot years. Annual rainfall is variable, but probably averages about 10-12 inches or roughly about half that of the Camargue, and sometimes less than one-third. It is mainly concentrated in October-November and in February-April, the average for June-August being less than 1 inch. The average year includes over

300 rainless days, but overcast skies occur nearly twice as often as in the Camargue, and evaporation is not so high, although still equivalent to more than three feet of precipitation annually.

Both the Camargue and the Coto, therefore, experience extremes of climate too exacting for the year-round tolerance of many species, yet sufficiently torrid in summer to recreate something approaching North African conditions in Europe. Moreover, both lie south of the zone which in relatively recent geological times was overwhelmed or blighted by glaciation, and both have long been within the fringe of the northward limits of palm trees and other subtropical vegetation, which, however, have a precarious hold in them owing to the occasional severity of their winters. Both also are geographically well placed for maintaining contact with the African fauna, for which they serve to some extent as bridgeheads in western Europe, most notably in the case of the Flamingo.\*

Both have in common a river delta from which arise their characteristic wide tracts of flat saline soil, sometimes drowned or turned to mud by flooding, sometimes parched and cracked by the sun. There is, however, a great difference between the Rhône and the Guadalquivir, and between the Mediterranean and the Atlantic, which creates important contrasts between the two. The Rhône and its tributary the Durance once carried down enormous masses of large boulders which still sterilise the interesting stony desert area known as La Crau, stretching east from the banks of the Grand Rhône between Arles and Istres. But these river-borne boulders do not stop at the Rhône; they merely dip underground and, in fact, underlie the whole of the more recent fine alluvium of the Camargue at a depth of rarely less than a hundred feet. Powerful and turbulent as the Rhône still appears, it is a shadow of its former self, and it now carries down a meagre load of sands, muds and pebbles in place of the coarser materials on which the Camargue was built up.

Already where the Grand and Petit Rhône divide at Arles to form the delta, the land is not more than about 10 feet above sea level, although even as the crow flies there is still nearly another thirty miles to go before the sea is reached. In the Camargue, altitudes of below 3 feet (or one metre) are frequent and some points are merely inches above sea level, or exceptionally even below it. The most significant eminence is the ancient relic of a sand-dune ridge known as the Bois de Rièges, where altitudes of 13 feet are reached at several points parallel to the coast and now about three miles inland. "Inland" is, however, a somewhat arbitrary term to apply to the Camargue with its extraordinary intermingling of endless saline lagoons with the tideless Mediterranean. Perhaps the most remarkable feature of this unstable and apparently transitory coast is that it seems to have

\*Scientific names of most of the species concerned are given in Table I on pages 513-516, and they are used in the text only if they do not appear in that table.



fluctuated within quite minor limits since Roman times. The sea-level in relation to the land at Marseilles, shown by the remains of Roman and Greek quays, was then much the same as at present, but in parts of the Camargue subsidence has since lowered the alluvium of the delta by up to 10 feet. Main changes within historical times have included the gradual formation of long curved sand-spits offshore and their linking up with the coast; the gradual obsolescence of some of the older river channels within the delta, which since medieval times have been transformed into farmlands; and the concentration of about 85 per cent of the Rhône waters in the Grand Rhône, while the Petit Rhône to the west carries the remainder. Although subsidence has tended to keep open the sea frontier, this has been offset during the past hundred years by the construction of embankments along the coast and alongside the river channels, which have artificially separated the waters of the Camargue from its fresh and salt-water neighbours.

The Guadalquivir estuary in Roman times was probably much more like the Camargue than it is now. A vast lagoon system called the *lacus lagustinus* covered much of the area from near Seville to the present Coto, offering a much larger and more attractive habitat for waders and aquatic birds than the surviving remnants, which we still find good. While the Rhône brings down and deposits increasingly sandy alluvium, the Guadalquivir smears over its *marismas* a fine sticky clayey slime containing only about twenty per cent of blended sand, and forming a soil hardly less intractable than concrete. Like that of the Camargue it is highly saline, the ground-water of the *marismas* averaging about one-third more salt content than the Mediterranean. Unlike the soil of the Camargue, it is generally infertile and carries a poor vegetation.

Two even more striking differences have emerged in recent times. While only a low bank separates the Camargue lagoons from the sea at many points, the *marismas* have, over several centuries, become cut off from the Atlantic by the highest line of sand-dunes in Europe. Except where the Guadalquivir reaches the Atlantic through a half-mile gap near Sanlucar, the forty-mile sandbar has blocked all the former outlets of this great delta. This gives the Coto Doñana a range of high and dry habitats unparalleled in the Camargue, and it also stores and pours out behind it copious reserves of fresh water on to the *marismas*. On the other hand the Guadalquivir has not yet been embanked, as the Rhône was just a century ago, and it accordingly continues in every normal winter and spring to flood the *marismas* with salt tidal water, which is prevented from flowing off again by the river's natural levees. Thus, while the Camargue is subject only to severe autumn floods, largely of rain-water, and is most saline near the coast, the *marismas* are flooded for several months each year with salt water mingling with the floods from the hinterland, and the most important lakes and streams of relatively

fresh water are along the belt nearest to the sea, immediately in the rear of the sand-dunes and above the level of the *marismas*.

The Mediterranean generates neither currents nor tides nor winds capable of achieving anything even faintly resembling what the Atlantic south-west gales and the strong south-easterly coast-wise current have done in barricading the Guadalquivir delta. Consequently, although subject to longer and more successful reclamation, the Camargue retains probably a good deal more of its former topography and habitats than the *marismas* of the Guadalquivir. Had their soil been more tractable and less inextricably permeated with salts, or had fresh water for irrigation been as readily available as at the tideless mouth of the Rhône, it is unlikely that anything could have prevented the *marismas* from being long since reclaimed for grazing and cultivation, which is still able to encroach only very gradually in face of much discouragement.

The differences between the Camargue and the Coto are therefore very great. The dry habitats of the Coto begin at the seashore, and are nearly all within 5-10 miles of the coast. The dry habitats of the Rhône delta almost all lie outside and behind the Camargue flanking the Grand Rhône on its left bank and the Petit Rhône on its right. The Rhône delta has only local low sand-dunes, while the Guadalquivir has no important tracts of pebbles; neither possesses important outcrops of rock. In both deltas, maps purporting to show inland waters usually bear little relation to reality at most seasons and in most years, but the Camargue has notably more extensive and better defined permanent or semi-permanent lakes or lagoons, and some of these are still linked with the sea.

In the Camargue the salt industry, which is much larger there, is close to the coast, but on the Guadalquivir it is concentrated along the lower estuary. Agricultural reclamation in both cases has been most active from the head of the delta downward, but there has also been some along the sand-dunes towards the Coto. Few and poor as the roads of the Camargue fortunately remain they form a highly developed network compared with those of the Coto and the *marismas*, much of which is still accessible only on horseback, or on foot, while very little indeed can be entered by vehicles, even with four-wheel drive. The Camargue, therefore, although extremely thinly inhabited, has a long-established and diversified population, whereas large areas of the *marismas* and the Coto have virtually no population except herdsmen and game-keepers looking after the large sporting estates.

In the Camargue there is a large Nature Reserve managed by the Société d'Acclimatation et de Protection de la Nature, and also a considerable private estate managed as a Nature Reserve with a well-equipped Research Station at La Tour du Valat. The Coto Doñana, the most important biologically of the estates in the Guadalquivir delta, has long been dedicated to a partnership

between sport and natural history, and the present owners have been most generous in giving facilities for scientific investigation, but there is no formal reserve or research station in the delta, and the conditions are such that any influx of visitors would not only be extremely inconvenient to all concerned, but could easily result in disastrous disturbance for the wild life. This is due partly to differences in the fauna.

In the Camargue it is possible, and is most convenient, to drive about in any ordinary vehicle and even without leaving the public road to get first-class views of Bee-eaters, Rollers, Hoopoes, several species of herons, Black-winged Stilts, Avocets, Kentish Plovers, Pratincoles, Whiskered and Gull-billed Terns (see plate 80 lower), Flamingos (plate 79 top and centre), Fantailed Warblers and, in fact, virtually all the species for which the Camargue is famed. Indeed most of these species are much more easily found outside the Reserve than within it, and it is probably true to say that in even moderately unfavourable weather the greater part of the Reserve is not safely accessible even to its guards.

The Coto and the *marismas* on the other hand cannot be seriously penetrated on day visits from outside and require all the transport and supply preparations of a minor field expedition. In the existing conditions these cannot be organized effectively by anyone except the owners of the Coto, on whose time and generosity visiting ornithologists must naturally take care not to impose too heavily or without good reason. Moreover, such typical Coto Doñana rarities as the Spanish Imperial Eagle, Purple Gallinule, Marbled Duck and Crested Coot cannot usually be watched at close range without creating considerable disturbance, which if often repeated would lead to desertion or to the loss of eggs and young at stages when they need constant brooding and protection. It cannot be too strongly emphasized, therefore, that, if the surviving wild life of the Coto Doñana is to be handed on to posterity, much greater self-restraint will be required than has normally been shown in places of intense bird-watching interest, and those whose presence is not essential to investigating the fauna and flora would contribute most to its future by visiting instead the more accessible though scattered places in the surrounding region, and in other parts of Andalusia, at one or other of which nearly all the typical Coto birds—and a number of others besides—can be watched with less trouble and less risk of disturbance.

For example, Little and Cattle Egrets can be seen in Andalusia wherever there is suitable water or feeding, and there is a very interesting cliff-nesting colony of the two species at Cape Trafalgar. The Isla Mayor and other fairly accessible parts of the northern *marismas* south of La Puebla del Rio, below Seville, are likely to provide Purple and Squacco Herons, Little and Cattle Egrets, Little Bittern, Marsh Harrier, Baillon's Crake, Purple Gallinule,



Black-winged Stilt, Pratincole, Black and Whiskered Terns, Crested Coot, Moustached and Great Reed Warblers, and so on—and one has almost as good a chance of seeing one of the remnant Glossy Ibises here as on the Coto Doñana proper. Egrets and herons may be seen feeding at the famous Laguna de la Janda near the road between Algeciras and Cadiz, though unfortunately, as a result of reed-cutting and drainage, this locality has rather less attraction than it had in the 1930's (see G. K. Yeates's *Bird Life in Two Deltas*); and Black-winged Stilts nest on the sewage-farm at Jerez de la Frontera. Red-crested Pochards, Gadwall, Ferruginous and White-headed Ducks are to be seen on suitable lakes, particularly reservoirs, in various parts of Andalusia, Huelva being as good an area as any. Marbled Ducks are more local (and quite easily missed even on the Coto Doñana), but one may perhaps find them almost anywhere up the Guadalquivir below Seville. The Cadiz salt-pans should produce Lesser Short-toed Larks, Tawny Pipits, Kentish Plovers, Avocets, Black-winged Stilts and possibly a Caspian Tern—and certainly many waders at migration-times; and this again applies to the region of Huelva. Azure-winged Magpies can be seen in the pine-woods of Coria del Rio a few miles south of Seville, and there are some places around Seville where the Red-necked Nightjar is plentiful. Booted Eagles, Rollers, Hoopoes, Sardinian, Rufous and Olivaceous Warblers are much more numerous off the Coto than on it, and Fan-tailed Warblers are widespread in both marsh and cornfields.

Both sandgrouse—the Black-bellied, which one identifies rather seldom on the Coto, and the Pin-tailed—can more easily be found on some of the stony plateaux of the interior. Then Griffon and Egyptian Vultures, like Black Kites, may be seen anywhere, and Lesser Kestrels in most towns—indeed among the best places to see Griffon Vultures and Lesser Kestrels are beneath the cliff-top towns of Ronda and Arcos de la Frontera, where one may see both at ranges down to 50 feet or less as they come in to land on the cliffs below.

At Ronda, too, are such essentially rock birds as Chough (*Pyrrhocorax pyrrhocorax*), Alpine Swift (*Apus melba*), Crag Martin (*Ptyonoprogne rupestris*), Blue Rock Thrush (*Monticola solitarius*), Rock Bunting (*Emberiza cia*) and Rock Sparrow (*Petronia petronia*). In the cork-woods at Almoraima may be seen more of the birds of prey—Short-toed and Booted Eagles, and both kites—and Cetti's Warbler, and still more species, such as Firecrest (*Regulus ignicapillus*) and Short-toed Treecreeper, which are not to be found on the Coto at all. In fact, many of Spain's most spectacular species—Bonelli's Eagle, Andalusian Hemipode (*Turnix sylvatica*), Audouin's Gull (*Larus audouinii*), Eagle Owl (*Bubo bubo*), Ruddy Shelduck (*Tadorna ferruginea*), Red-rumped Swallow (*Hirundo daurica*), Alpine Chough (*Pyrrhocorax graculus*), Rock Thrush (*Monticola saxatilis*), Black

Wheatear (*Oenanthe leucura*) and, above all, Lammergeyer (*Gypaëtus barbatus*), and even Great Bustard, are none of them to be found on the Coto Doñana proper, and most of these will not be seen in the *marismas*.

It is therefore very much to be hoped that interested bird-watchers will explore such alternatives and will not seek to visit the Coto unless they are willing to make some real contribution to its natural history or conservation.

To some extent the same applies to the Camargue Reserve, whose protectors are annually swamped with requests to visit, which appear to be, as already shown, due largely to misunderstanding. While a botanist would probably be unable to see all the botanically interesting species of the region without obtaining a permit for the Reserve, the same is not true for birds. So far in fact is it from being the case that in an average season a well-informed visitor wishing to see all the rare species most conveniently and satisfactorily would probably not include any part of the Reserve in his itinerary, although he would have to obtain access to two or three other areas which are kept private, in order to be sure of close views of a minority of species. This is not to say that the Reserve is not of great importance, but its supreme interest is ecological and physiographic and it happens not to include a number of the very specialized habitats preferred by several of the rarest breeding birds. In addition, a high proportion of the Reserve's surface is normally covered with, or cut off by, water. It would therefore be a help to the Reserve administration if visitors would not apply for facilities on the Reserve unless they are quite sure that what they wish to look at cannot be seen as well, or better, elsewhere. Although the Reserve extends over 37,500 acres, four-fifths of the Camargue proper lies outside its borders, besides all the other bird-rich regions stretching westward from the Petite Camargue to Aigues-Mortes, and the Crau and the Alpilles with their distinct and almost equally interesting avifauna.

So much has been written simply in the form of bird lists or travel diaries on these fascinating delta regions that in the foregoing pages an attempt has been made to provide some critical and comparative background information. We are, of course, only too well aware that in so short and oversimplified an outline geographers and others will find plenty to criticize. Moreover, fresh knowledge is now coming in so fast that any such sketch must soon become out of date in certain respects. If it serves to assist interested bird-watchers and possibly also to stimulate more thorough survey and more considered interpretation it will have fulfilled its purpose. In a forthcoming issue the various habitats of the Coto Doñana, and the birds and other species characteristic of each, will be reviewed by Don José Antonio Valverde. Later, Dr. L. Hoffmann will contribute a similar

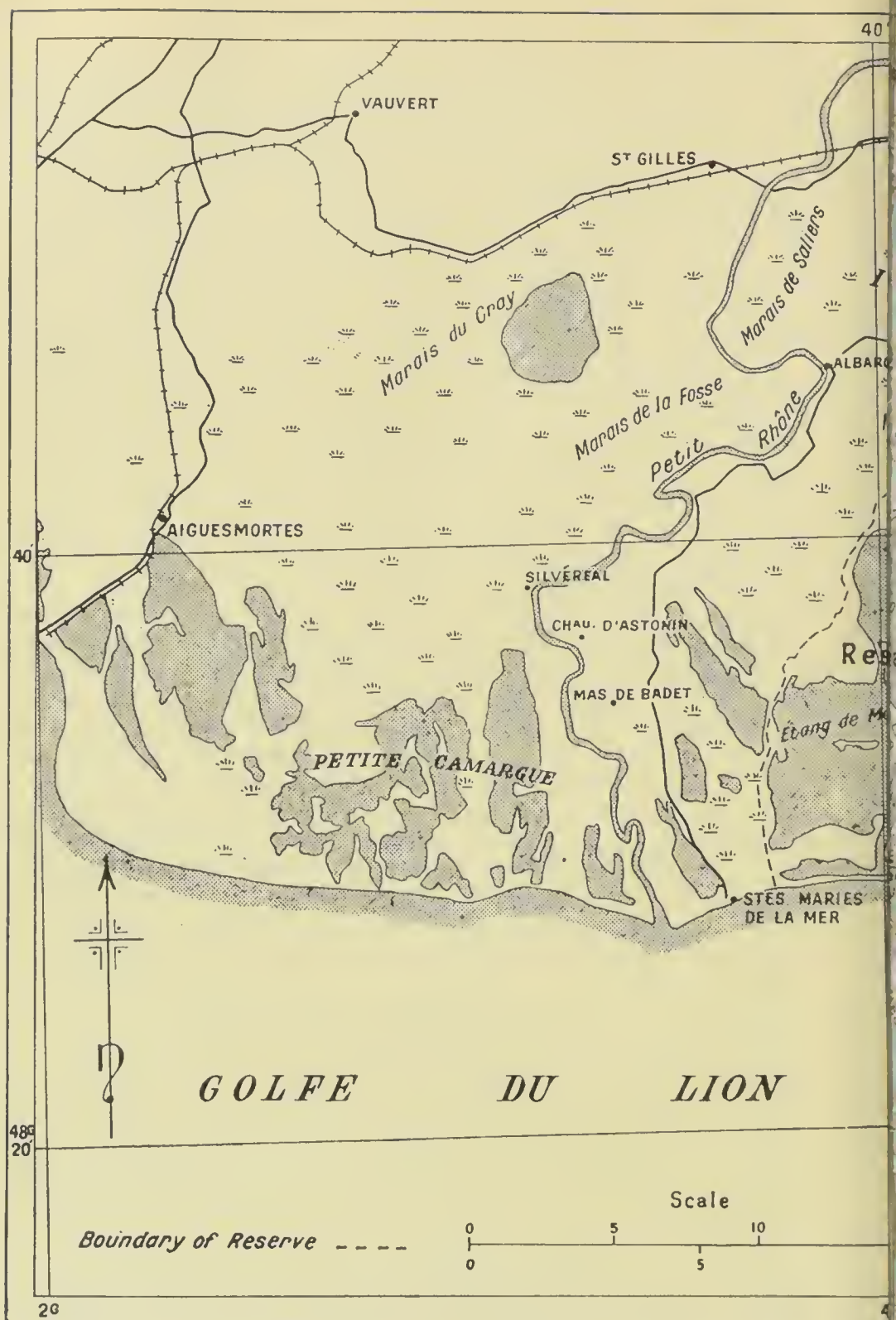
authoritative study of the habitats and birds of the Camargue. We therefore conclude this introductory account by a brief comparative review of the ecology and avifauna of the two regions.

Even for those who know both the Camargue and the Coto it is not easy to compare and contrast the two. After analysing the structure and evolution of both deltas, we now briefly sketch two imaginary transects to indicate broadly the birds typical of each zone, going inland through the Camargue from the Mediterranean and through the Coto from the Atlantic. The transect lines in each case are deliberately chosen to intersect the greatest possible variety of habitats, and to make the fullest use of available knowledge. That for the Camargue runs north-west from the south-east corner of the region between the Grand Rhône and the sea, through the Badon/Tour du Valat area and the Vaccarès to the Marais de la Grand Mar (Map 1, pp. 506-507). That for the Coto runs from the shore at Matalascañas through the Laguna de Santa Olalla and the Palacio de Doñana out on to the *marismas* (Map 2, pp. 508-509). The first is about 15 miles long and the second about 7 miles.

Crossing the Mediterranean coast west of the mouth of the Grand Rhône, the low flat land is interspersed with shallow, highly saline lagoons which are a breeding habitat of Avocets, Shelducks, Redshanks, Common and Little Terns, Oystercatchers, Black-winged Stilts, Herring and Black-headed Gulls and in some seasons Flamingos, the last fortunately well-protected by guards living along the few access routes. The numbers of Flamingos (plate 79 top and centre) have reached as high a level as 8,000, but those of the terns, Black-headed Gulls and Avocets are each in the low hundreds and the remainder each well below a hundred. In winter, however, these lagoons attract up to 15-20,000 Wigeon (*Anas penelope*) (representing much the greater part of the Camargue wintering population) and some thousands each of Gadwall and Mallard. Few parts of the Camargue are so bare and featureless, but few have higher densities of birds.

Continuing parallel with the sea-bank, which separates the lagoons still linked with the Mediterranean from those affected by land drainage, the salt-pans and tracts of mud or water give place to areas of cultivation with tamarisks and other cover, divided by drainage channels. This zone of farm-land, although pleasant, has few species of birds other than the obvious ones generally typical of such country in western Europe. Along the drains grow elms, white poplars, alders and other trees originally confined to the riverside woodlands fringing the branches of the Rhône. Golden Orioles, Hoopoes, Scops Owls, Melodious and Cetti's Warblers, Jackdaws and Penduline Tits are among the typical birds, with Goldfinches, House Sparrows and Swallows near the not infrequent houses, and Skylarks and Corn Buntings in the fields.





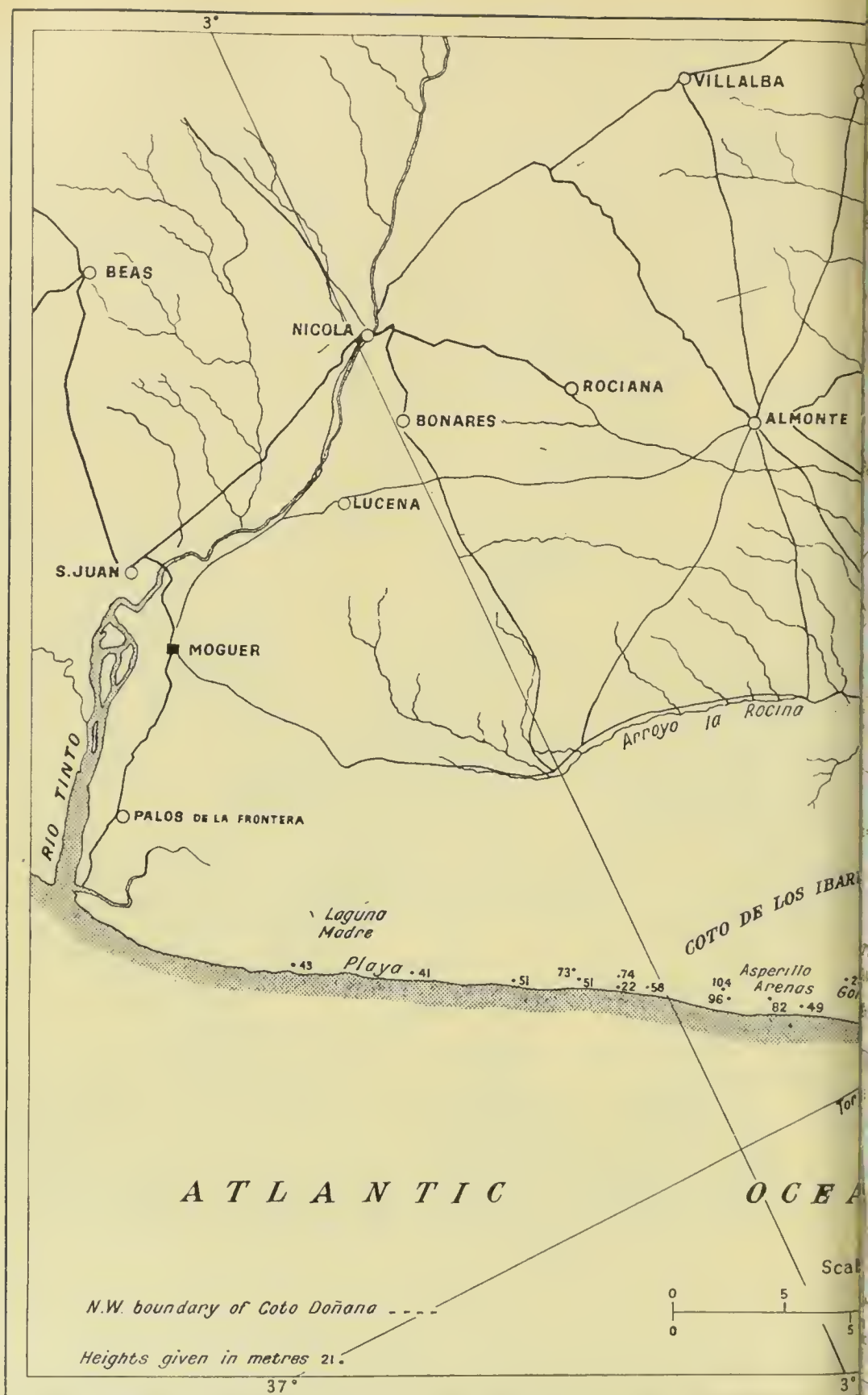
MAP I—THE RHÔNE DELTA, SHOWING THE ILE DE LA CAMARGUE FORMED BETWEEN THE RHÔNE AND THE MEDITERRANEAN SEA.

Both here and in Map 2 the small scale has made it impossible to include all the details of the maps will, with the plates and with the transects discussed on pages 505 and 510. The Reserve boundaries follow those on official French maps, but evidently include large areas of scientific Reserve of



D PETIT RHÔNES, WITH THE PETITE CAMARGUE ON THE WESTERN SIDE AND

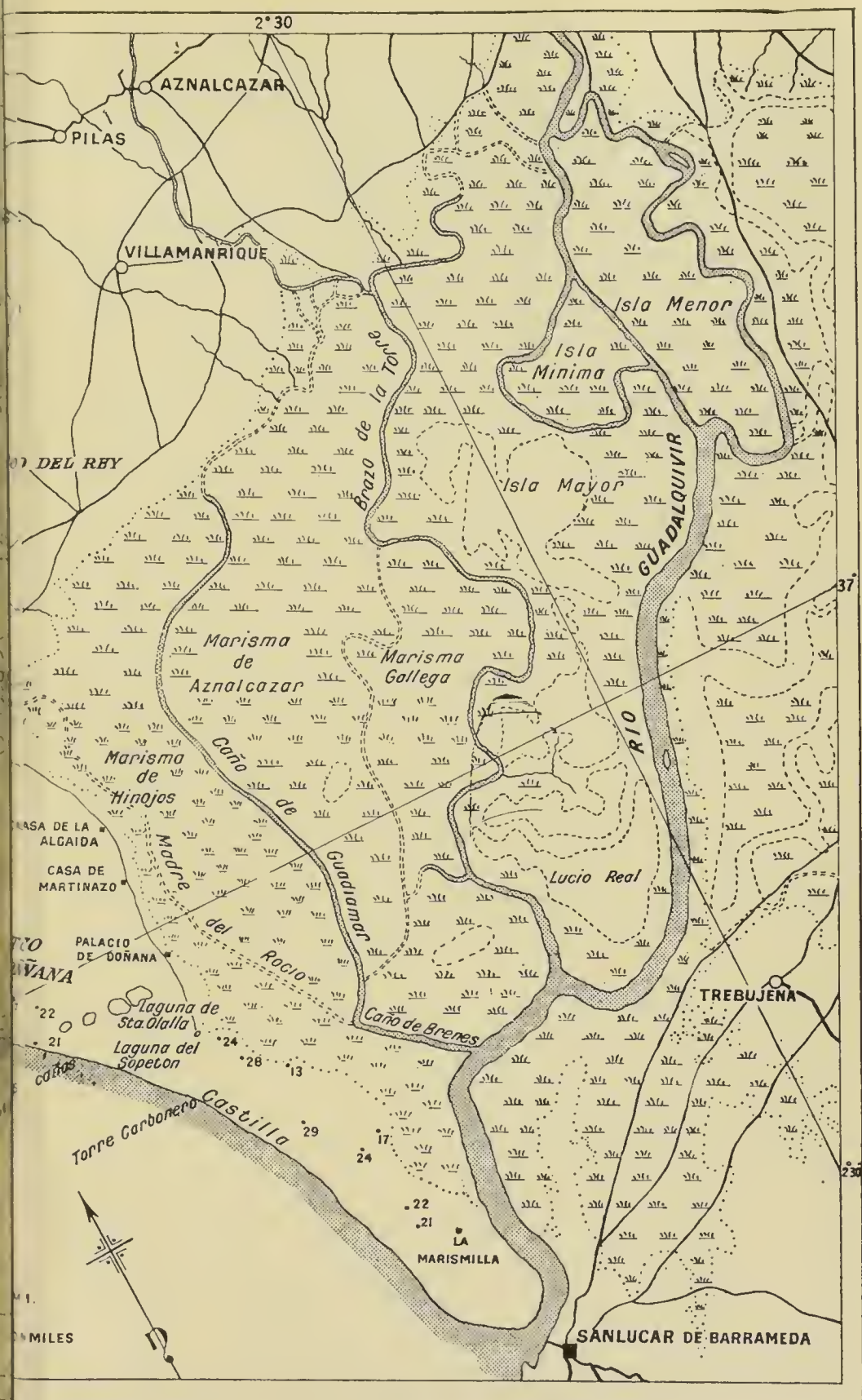
in the text and in the descriptions beneath plates 69-80. It is hoped, however, that possible for readers to form an impression of the physiography. On this map the in independent private occupation; they do not, however, include the private (see page 501).



MAP 2—THE GUADALQUIVIR DELTA, SHOWING THE COTO DOÑANA, THE COTO DE LOS

This map is taken from old Spanish ones, and "Coto Doñana", "Matalascañas"





THE REMAINDER OF THE SAND-RIDGE WHICH EXTENDS TO PALOS DE LA FRONTERA

de las Madres" are now more regular spellings. See transect on pages 510-512.

Where irrigation and drainage have not penetrated, the high salinity and high water-table with prolonged seasonal flooding maintain large tracts of *sansouire* or *Salicornia* salt-steppe, the Camargue's main equivalent of the Guadalquivir's *marismas*. This has been subdivided according to differences in salinity and in the duration of seasonal flooding, which lead to important differences in the composition and extent of vegetation cover. Characteristic birds are the Stone Curlew, Red-legged Partridge, Kentish Plover (plate 79 bottom), Pratincole (plate 80 upper), Short-toed Lark and Spectacled Warbler. Magpies, Woodchat Shrikes and White-throats breed in small thickets on the slightly higher ground, possibly originating in former sand-dunes such as still support the primitive woodland of *Juniperus phoenicea* in the Bois de Rièges to the south of the Vaccarès. This forms a vestigial counterpart of the high and rich sand-dunes of the Coto Doñana.

The neighbouring depressions are occupied sometimes by extensive reed-beds containing breeding Marsh Harriers, Bitterns, Bearded Tits and colonies of Purple Herons, and sometimes by fresh-water pools fringed or invaded by tamarisk scrub and by sedge and other aquatic plants (see plate 71). These are favourite spots for the black bulls and white horses, whose trampling and browsing is an important ecological factor, even for nesting birds. Here is the habitat of Great Crested and Little Grebes, Mallard, Gadwall and Red-crested Pochard, Little Bittern, Moorhen, Coot and Whiskered Tern, besides considerable numbers of mainly non-resident waders and passage species such as Wood Sandpipers and Black Terns, foraging Night Herons and, in some seasons, breeding Black-winged Stilts. These fresh-water meres or lakes are somewhat confusingly located, closely fringing the formerly salt and now brackish Etang du Vaccarès, a shallow lake nearly seven miles across, with numerous subsidiary lagoons, forming much the largest sheet of permanent water (plate 79 centre).

It is in the alluvial "cliffs" east and north of the Vaccarès, eaten away by wave erosion to a depth of around five feet, that the Bee-eaters have their main colonies. Increasing surplus fresh water, drained from the recently reclaimed rice-fields to the north, has made the Vaccarès unsuitable for breeding Flamingoes. These rice-fields are, however, attractive to Gull-billed Terns and other species, notably Little Egrets from breeding colonies along the Rhône. In this area north of the Vaccarès, reclamation for growing vines and cereals has also gone far to destroy the natural habitats, and this combined with planting of windbreaks of cypresses for shelter from the *mistral* give the country from here up to Arles a generally cultivated character, although geographically it must be included in the Camargue.

The corresponding transect through the habitats of the Coto Doñana is considerably simpler. Beginning on the Atlantic shore the habitat is not unlike that on such English beaches as Branton



Burrows in Devon or Ravenglass in Cumberland. A few Kentish Plovers breed here, and perhaps single pairs of Caspian Terns, but the Kentish nest much more commonly on dry ground on the *marismas*. The sand-dunes rise in successive ridges to remarkable heights, not infrequently reaching about 100 feet, while the highest exceed 300 feet. Some of these form Sahara-like masses of bare drifting sand (plate 69 upper), menacing the extensive woodlands of introduced stone pines (or umbrella pines) (plate 72 right) and the seasonally flooded moist rushy slacks which are interspersed among them, and which form the habitat of such interesting breeding species as the Azure-winged Magpie, Short-toed Eagle, Spanish Imperial Eagle, Hobby, Red-necked Nightjar, and Orphean Warbler. As the characteristic low heath formed by the glaucous, cistus-like shrubby *Halimium* begins (plate 69 lower), birds such as Stone Curlew, Red-legged Partridge and Thekla Lark occur sparsely. Only a mile or two inland this arid country is interrupted by a remarkable chain of small fresh-water lakes (plate 77 lower), which, unfortunately, are steadily shrinking in size through encroachment by the dunes on these last traces of former delta channels of the Guadalquivir. These lagoons are breeding places of Great Crested and Little Grebes, Red-crested Pochard, Mallard, Ferruginous and White-headed Ducks and of Coot and Crested Coot, Moorhen and Purple Heron. Like the corresponding *étangs* of the Camargue, these *lagunas* are also favourite halting places of migrating waders and terns, and foraging centres for birds of prey and for *marisma* species such as Pratincoles, at least in drier seasons.

Eastwards lies a rather broad low plateau, still higher than any part of the Camargue, overgrown with *Halimium* and other shrubs including species of gorse, broom, bramble and tree-heath, and inhabited by Dartford Warblers, Magpies, Great Spotted Cuckoos, Stonechats and (where thickets of pistachio or bramble occur) by Sardinian and Melodious Warblers, Nightingales and at one point large numbers of breeding Little and Cattle Egrets, Night Herons and Squacco Herons. This colony is mainly located in tree-heath and bramble (plates 73-76), but some Little and a few Cattle Egrets build in neighbouring cork oaks, with smaller numbers of Common Herons and White Storks (plate 76 lower). In other scattered cork oaks nest Kites, Black Kites, Kestrels, Barn and Little Owls, numerous Jackdaws, Green Woodpeckers and Great Tits. (In the Camargue the climax vegetation is supposed to be ilex or holm oak, but it cannot be seen developing as on the Coto.) On the rear fringe of the sandy plateau Spotless Starlings, House Sparrows, Goldfinches, Swallows and a few Hoopoes also breed near habitations, and Bee-eaters on the grassy swards where they are forced by lack of banks to burrow in flat ground (*antea*, pp. 263-267, plates 43-45). Here the ground-level falls steeply as the sand gives way to the underlying alluvial clay and springs flow



out on to the lawns and rushy fields sloping down to the *marismas*, at about 3-5 feet above sea-level (which would still rank as high ground in the Camargue). By contrast, as plate 77 upper shows, in the southern end of the Coto the extensive pine-woods come down almost to the very edge of the water. Many Fan-tailed Warblers, and much smaller numbers of Savi's, nest in the clumps of *Juncus* that fringe the *marismas*.

From here eastwards in normal seasons all but occasional small low islets remains under water from November until May when the *marismas* dry out, leaving shrinking stretches of standing water flanked by tall reed-mace, reeds and rushes, where the same species breed as on the *lagunas* and in addition Marsh Harriers, Black and Whiskered Terns and Black-winged Stilts (plate 78 centre). On the islets are sometimes dense breeding colonies of Pratincoles, Black-winged Stilts, Avocets and Kentish Plovers, while the *Salicornia* areas, roughly corresponding to the *sansouire* of the Camargue, have a breeding population of Pin-tailed Sandgrouse, Montagu's Harriers, Stone Curlews, Short-toed, Lesser Short-toed and Calandra Larks, and Yellow Wagtails.

This blend of *marismas* habitats (plates 70 and 78) continues for many miles inland until it reaches and crosses the Guadalquivir (plate 72 left), but, as in the Camargue, reclamation for rice-growing is encroaching steadily down-river from near the head of the delta, particularly on the Isla Mayor.

The object of this much simplified sketch is merely to provide a brief introduction to the comparison of habitats which will be more fully worked out in the two special contributions by Señor Valverde on the Coto and by Dr. Hoffmann on the Camargue. Many qualifications and some habitats of not inconsiderable significance have had to be omitted for reasons of space. Perhaps, as remarked earlier, the outstanding contrasts are that in the Camargue the main saline and lagoon areas are nearest the sea and in the middle of the delta, flanked by the drier zones through which flow the rivers bordered by woods, while the Coto Doñana exhibits a broad and elevated arid strip along the coast, interrupted by woods and backed by small lagoons, the great saline and seasonally flooded tracts being farther back and linked not directly with the sea but with the river.

The following Table lists the species which are at present known to breed in the Camargue or the Guadalquivir of both, or which are present there regularly during the breeding season. In neither case can the area covered be very precisely defined, but as the Camargue has been fairly intensively covered by observers the list relates to the whole area and includes records from adjoining parts of the Rhône delta. The Guadalquivir list is largely based on that compiled by the 1956 and 1957 Coto Doñana Expeditions, and therefore relates chiefly to a rather small part of the Guadalquivir delta, although to much the richest part for birds; some species have been added from the published and un-

published records of other observers, but there is little doubt that further work at other edges of the *marismas* would increase the total. The columns are so arranged that it can readily be seen which of the species are common to Britain, the Camargue and the Guadalquivir, or to each pair of these areas, or are peculiar to either the Guadalquivir or the Camargue.

TABLE I—BIRDS COMPOSING THE MAIN BREEDING-SEASON POPULATIONS OF THE GUADALQUIVIR DELTA, S.W. SPAIN, AND THE CAMARGUE REGION, S. FRANCE

This table lists the species which are known to breed commonly (B), or more locally and in small numbers (L), in the Guadalquivir and the Camargue; or which are regularly present (P) in either area during the nesting-season, as parties of immatures and non-breeding birds or for feeding purposes. Where there is some slight doubt about the status, the most probable category is shown in parentheses; this particularly applies to the Guadalquivir, which has been less thoroughly studied than the Camargue.

In order to emphasize which of these species are essentially "southern" in character, and which "northern", a third column has been added to show how many of them breed (B or L), or occur as regular migrants (M), in the British Isles; Guadalquivir and Camargue species which are only vagrants to Britain are not referred to in the third column.

Except in the cases of interesting remnant species (e.g. Glossy Ibis)—marked X—isolated or irregular occurrences, non-breeding species found in minute numbers (e.g. Cormorant, *Phalacrocorax carbo*, on the Camargue), winterers staying on casually into the breeding-season (e.g. Grey Lag Goose, *Anser anser*, on the Coto Doñana), as well as all passage-migrants, are omitted from the Guadalquivir and Camargue lists. This last means that a number of species commonly seen in the two deltas during April and May are ignored—notably many northern waders, warblers, flycatchers and so on.

For the purpose of this list, the Camargue is taken as the whole of the Rhône delta area, i.e. the Camargue proper between the Grand Rhône and the Petite Rhône, plus the Petite Camargue on the west side and the Crau desert and scrub on the east; similarly, the Guadalquivir covers the whole delta, including the vast sand-ridge between the main river and the Rio Tinto, though most of the categories are based on the Coto Doñana proper and on the neighbouring *marismas*. Casting the boundaries as wide as this results in the inclusion (as L) of a few species in each case which are not really typical of the area, but we think it simpler to follow the geographical boundaries rather than to adhere strictly to the zoological ones.

	Guadalquivir	Camargue	Britain
Great Crested Grebe ( <i>Podiceps cristatus</i> ) ...	L	B	B
Black-necked Grebe ( <i>Podiceps nigricollis</i> ) ...	L		L
Little Grebe ( <i>Podiceps ruficollis</i> ) ...	B	B	B
Heron ( <i>Ardea cinerea</i> ) ...	L	P	B
Purple Heron ( <i>Ardea purpurea</i> ) ...	B	B	
Little Egret ( <i>Egretta garzetta</i> ) ...	B	B	
Squacco Heron ( <i>Ardeola ralloides</i> ) ...	B	L	
Cattle Egret ( <i>Ardeola ibis</i> ) ...	B		
Night Heron ( <i>Nycticorax nycticorax</i> ) ...	B	B	
Little Bittern ( <i>Ixobrychus minutus</i> ) ...	L	B	
Bittern ( <i>Botaurus stellaris</i> ) ...	B	B	L
White Stork ( <i>Ciconia ciconia</i> ) ...	B	X	
Spoonbill ( <i>Platalea leucorodia</i> ) ...	L		M
Glossy Ibis ( <i>Plegadis falcinellus</i> ) ...	X	X	
Flamingo ( <i>Phoenicopterus ruber</i> ) ...	P	B	
Mallard ( <i>Anas platyrhynchos</i> ) ...	B	B	B
Teal ( <i>Anas crecca</i> ) ...	(L)		B
Marbled Duck ( <i>Anas angustirostris</i> ) ...	L	X	
Garganey ( <i>Anas querquedula</i> ) ...	L	B	L

	Guadalquivir	Camargue	Britain
Gadwall ( <i>Anas strepera</i> ) ... ..	B	B	L
Pintail ( <i>Anas acuta</i> ) ... ..	L	L	L
Shoveler ( <i>Spatula clypeata</i> ) ... ..	(L)	L	B
Red-crested Pochard ( <i>Netta rufina</i> ) ... ..	B	B	(M)
Pochard ( <i>Aythya ferina</i> ) ... ..	(L)	P	B
Ferruginous Duck ( <i>Aythya nyroca</i> ) ... ..	B		
Eider ( <i>Somateria mollissima</i> ) ... ..		P	B
White-headed Duck ( <i>Oxyura leucocephala</i> ) ... ..	L		
Shelduck ( <i>Tadorna tadorna</i> ) ... ..		B	B
Egyptian Vulture ( <i>Neophron percnopterus</i> ) ... ..	P	P	
Griffon Vulture ( <i>Gyps fulvus</i> ) ... ..	P		
Black Vulture ( <i>Aegypius monachus</i> ) ... ..	P		
Golden Eagle ( <i>Aquila chrysaetos</i> ) ... ..	P		L
Imperial Eagle ( <i>Aquila heliaca</i> ) ... ..	B		
Bonelli's Eagle ( <i>Hieraetus fasciatus</i> ) ... ..		P	
Booted Eagle ( <i>Hieraetus pennatus</i> ) ... ..	L		
Buzzard ( <i>Buteo buteo</i> ) ... ..	L		B
Sparrowhawk ( <i>Accipiter nisus</i> ) ... ..		(L)	B
Kite ( <i>Milvus milvus</i> ) ... ..	B		L
Black Kite ( <i>Milvus migrans</i> ) ... ..	B	B	
Marsh Harrier ( <i>Circus aeruginosus</i> ) ... ..	B	B	L
Montagu's Harrier ( <i>Circus pygargus</i> ) ... ..	L	B	L
Short-toed Eagle ( <i>Circus gallicus</i> ) ... ..	L	P	
Hobby ( <i>Falco subbutco</i> ) ... ..	L	L	L
Peregrine ( <i>Falco peregrinus</i> ) ... ..	L		B
Lesser Kestrel ( <i>Falco naumanni</i> ) ... ..	P	L	
Kestrel ( <i>Falco tinnunculus</i> ) ... ..	B	B	B
Red-legged Partridge ( <i>Alectoris rufa</i> ) ... ..	B	B	B
Quail ( <i>Coturnix coturnix</i> ) ... ..	B	(L)	L
Water Rail ( <i>Rallus aquaticus</i> ) ... ..	B	B	B
Spotted Crake ( <i>Porzana porzana</i> ) ... ..	(L)	L	(L)
Baillon's Crake ( <i>Porzana pusilla</i> ) ... ..	L	L	
Little Crake ( <i>Porzana parva</i> ) ... ..	(L)	(L)	
Purple Gallinule ( <i>Porphyrio porphyrio</i> ) ... ..	L		
Moorhen ( <i>Gallinula chloropus</i> ) ... ..	B	B	B
Coot ( <i>Fulica atra</i> ) ... ..	B	B	B
Crested Coot ( <i>Fulica cristata</i> ) ... ..	L		
Great Bustard ( <i>Otis tarda</i> ) ... ..	P		
Little Bustard ( <i>Otis tetrax</i> ) ... ..	(L)	L	
Oystercatcher ( <i>Haematopus ostralegus</i> ) ... ..	P	B	B
Lapwing ( <i>Vanellus vanellus</i> ) ... ..	B	B	B
Kentish Plover ( <i>Charadrius alexandrinus</i> ) ... ..	B	B	(L)
Redshank ( <i>Tringa totanus</i> ) ... ..	B	B	B
Avocet ( <i>Recurvirostra avosetta</i> ) ... ..	B	B	L
Black-winged Stilt ( <i>Himantopus himantopus</i> ) ... ..	B	B	
Stone Curlew ( <i>Burhinus oedicephalus</i> ) ... ..	B	B	L
Pratincole ( <i>Glareola pratincola</i> ) ... ..	B	L	
Herring Gull ( <i>Larus argentatus</i> ) ... ..	P	B	B
Slender-billed Gull ( <i>Larus genei</i> ) ... ..	L	L	
Black-headed Gull ( <i>Larus ridibundus</i> ) ... ..	P	B	B
Black Tern ( <i>Chlidonias niger</i> ) ... ..	B	P	M
Whiskered Tern ( <i>Chlidonias hybrida</i> ) ... ..	B	B	
Gull-billed Tern ( <i>Gelochelidon nilotica</i> ) ... ..	L	B	
Caspian Tern ( <i>Hydroprogne caspia</i> ) ... ..	(L)		
Common Tern ( <i>Sterna hirundo</i> ) ... ..		B	B
Roseate Tern ( <i>Sterna dougallii</i> ) ... ..		L	L
Little Tern ( <i>Sterna albifrons</i> ) ... ..	L	B	B
Sandwich Tern ( <i>Sterna sandvicensis</i> ) ... ..	P	L	B
Black-bellied Sandgrouse ( <i>Pterocles orientalis</i> ) ... ..	P		
Pin-tailed Sandgrouse ( <i>Pterocles alchata</i> ) ... ..	L	L	



	Guadalquivir	Camargue	Britain
Woodpigeon ( <i>Columba palumbus</i> ) ... ..	B	P	B
Turtle Dove ( <i>Streptopelia turtur</i> ) ... ..	B	B	B
Cuckoo ( <i>Cuculus canorus</i> ) ... ..	(L)	B	B
Great Spotted Cuckoo ( <i>Clamator glandarius</i> ) ...	B	(L)	
Barn Owl ( <i>Tyto alba</i> ) ... ..	B	B	B
Scops Owl ( <i>Otus scops</i> ) ... ..	(L)	B	
Little Owl ( <i>Athene noctua</i> ) ... ..	B	B	B
Tawny Owl ( <i>Strix aluco</i> ) ... ..		L	B
Long-eared Owl ( <i>Asio otus</i> ) ... ..		L	B
Nightjar ( <i>Caprimulgus europaeus</i> ) ... ..	(L)	(L)	B
Red-necked Nightjar ( <i>Caprimulgus ruficollis</i> ) ...	B		
Swift ( <i>Apus apus</i> ) ... ..	B	B	B
Pallid Swift ( <i>Apus pallidus</i> ) ... ..	(L)	P	
Kingfisher ( <i>Alcedo atthis</i> ) ... ..		(L)	B
Bee-eater ( <i>Merops apiaster</i> ) ... ..	B	B	
Roller ( <i>Coracias garrulus</i> ) ... ..	(L)	B	
Hoopoe ( <i>Upupa epops</i> ) ... ..	L	B	M
Green Woodpecker ( <i>Picus viridis</i> ) ... ..	B	B	B
Great Spotted Woodpecker ( <i>Dendrocopos major</i> ) ...	L	L	B
Lesser Spotted Woodpecker ( <i>Dendrocopos minor</i> )		L	L
Calandra Lark ( <i>Melanocorypha calandra</i> ) ... ..	L	L	
Short-toed Lark ( <i>Calandrella cinerea</i> ) ... ..	B	B	
Lesser Short-toed Lark ( <i>Calandrella rufescens</i> ) ...	B		
Crested Lark ( <i>Galerida cristata</i> ) ... ..	(L)	B	
Thekla Lark ( <i>Galerida theklae</i> ) ... ..	B		
Woodlark ( <i>Lullula arborea</i> ) ... ..	L	(L)	L
Skylark ( <i>Alauda arvensis</i> ) ... ..		B	B
Swallow ( <i>Hirundo rustica</i> ) ... ..	B	B	B
House Martin ( <i>Delichon urbica</i> ) ... ..		B	B
Golden Oriole ( <i>Oriolus oriolus</i> ) ... ..	B	B	M
Raven ( <i>Corvus corax</i> ) ... ..	B		B
Carriion Crow ( <i>Corvus corone</i> ) ... ..	P	L	B
Jackdaw ( <i>Corvus monedula</i> ) ... ..	B	B	B
Magpie ( <i>Pica pica</i> ) ... ..	B	B	B
Azure-winged Magpie ( <i>Cyanopica cyanus</i> ) ... ..	B		
Jay ( <i>Garrulus glandarius</i> ) ... ..		(L)	B
Great Tit ( <i>Parus major</i> ) ... ..	B	B	B
Blue Tit ( <i>Parus caeruleus</i> ) ... ..	L	(L)	B
Crested Tit ( <i>Parus cristatus</i> ) ... ..	(L)		L
Long-tailed Tit ( <i>Aegithalos caudatus</i> ) ... ..		L	B
Penduline Tit ( <i>Remiz pendulinus</i> ) ... ..		B	
Bearded Tit ( <i>Panurus biarmicus</i> ) ... ..		B	L
Short-toed Treecreeper ( <i>Certhia brachydactyla</i> ) ...		L	
Vren ( <i>Troglodytes troglodytes</i> ) ... ..	L		B
Mistle Thrush ( <i>Turdus viscivorus</i> ) ... ..		(L)	B
Blackbird ( <i>Turdus merula</i> ) ... ..	L	L	B
Black-eared Wheatear ( <i>Oenanthe hispanica</i> ) ...		L	
Stonechat ( <i>Saxicola torquata</i> ) ... ..	L	L	L
Nightingale ( <i>Luscinia megarhynchos</i> ) ... ..	B	B	B
Cetti's Warbler ( <i>Cettia cetti</i> ) ... ..	L	B	
Savi's Warbler ( <i>Locustella luscinioides</i> ) ... ..	L	L	
Moustached Warbler ( <i>Luscinia melanopogon</i> ) ...	(L)	B	
Great Reed Warbler ( <i>Acrocephalus arundinaceus</i> )	L	B	
Reed Warbler ( <i>Acrocephalus scirpaceus</i> ) ... ..	(L)	B	B
Melodious Warbler ( <i>Hippolais polyglotta</i> ) ... ..	B	B	
Olivaceous Warbler ( <i>Hippolais pallida</i> ) ... ..	(L)		
Blackcap ( <i>Sylvia atricapilla</i> ) ... ..	(L)	B	B
Orphean Warbler ( <i>Sylvia hortensis</i> ) ... ..	L	L	
Whitethroat ( <i>Sylvia communis</i> ) ... ..	L	B	B

	Guadalquivir	Camargue	Britain
Sardinian Warbler ( <i>Sylvia melanocephala</i> ) ...	B	L	
Subalpine Warbler ( <i>Sylvia cantillans</i> ) ...	L	L	
Spectacled Warbler ( <i>Sylvia conspicillata</i> ) ...	L	B	
Dartford Warbler ( <i>Sylvia undata</i> ) ...	B	(L)	L
Rufous Warbler ( <i>Agrobates galactotes</i> ) ...	(L)		
Fan-tailed Warbler ( <i>Cisticola juncidis</i> ) ...	B	B	
Bonelli's Warbler ( <i>Phylloscopus bonelli</i> ) ...	(L)		
Spotted Flycatcher ( <i>Muscicapa striata</i> ) ...	(L)	L	B
Tawny Pipit ( <i>Anthus campestris</i> ) ...	L	B	M
Yellow Wagtail ( <i>Motacilla flava</i> ) ...	B	B	B
Great Grey Shrike ( <i>Lanius excubitor</i> ) ...	B	L	M
Lesser Grey Shrike ( <i>Lanius minor</i> ) ...		L	
Woodchat Shrike ( <i>Lanius senator</i> ) ...	L	L	M
Starling ( <i>Sturnus vulgaris</i> ) ...		L	B
Spotless Starling ( <i>Sturnus unicolor</i> ) ...	B		
Greenfinch ( <i>Chloris chloris</i> ) ...		L	B
Goldfinch ( <i>Carduelis carduelis</i> ) ...	B	B	B
Linnet ( <i>Carduelis cannabina</i> ) ...		B	B
Serin ( <i>Serinus canarius</i> ) ...	L	L	
Chaffinch ( <i>Fringilla coelebs</i> ) ...	L	L	B
Corn Bunting ( <i>Emberiza calandra</i> ) ...	L	B	B
Cirl Bunting ( <i>Emberiza cirlus</i> ) ...		(L)	L
Ortolan Bunting ( <i>Emberiza hortulana</i> ) ...		(L)	M
Reed Bunting ( <i>Emberiza schoeniclus</i> ) ...	(L)	B	B
House Sparrow ( <i>Passer domesticus</i> ) ...	B	B	B
Tree Sparrow ( <i>Passer montanus</i> ) ...		B	B
Totals	138	134	98

ANALYSIS :	Common to Guadalquivir, Camargue and Britain ...	67
	Common to Guadalquivir and Britain (but not Camargue) ...	10
	Common to Camargue and Britain (but not Guadalquivir) ...	21
	Common to Guadalquivir and Camargue (but not Britain) ...	41
	Peculiar to Guadalquivir ...	20
	Peculiar to Camargue ...	5

Although migrants have been excluded from the Guadalquivir and Camargue lists, it would be slightly misleading not to point out that several of the birds in the Guadalquivir list occur regularly as migrants in the Camargue, and vice versa, in some cases in considerable numbers. Of Guadalquivir birds that pass through the Camargue, one should mention Cattle Egret, Spoonbill, Teal, Buzzard, Kite, Peregrine and Bonelli's Warbler; and, on the other side of the scales, Common Tern, House Martin, Black-eared Wheatear and Ortolan Bunting are all seen regularly on passage in the Coto Doñana, and at least Skylark, Starling and Linnet winter there.

Any such list must be treated with some reserve since probably no two persons would admit and reject exactly the same species. Nevertheless it serves to show the broad resemblances and differences in the breeding-season avifauna of the two regions, and how both relate to our own.

Of the 164 species listed, 89, or a little over half, may be regarded as "northern", in the sense that they breed with some regularity in Britain, while the remaining 75 are "southern", although a few of them breed up to the latitude of southern England on the Continent, and a few are occasional breeders with us. (The Great Grey Shrike is an exception, having part of its breeding range much farther north.)

Of the northern forms two-thirds are common to all three areas,

while, as might be expected, those of the residue which are common to Britain and the Camargue exceed those which are common to Britain and the more southerly Guadalquivir by two to one. Similarly, it is natural that, of the southern species which are not common to the Camargue and the Guadalquivir, the more southerly Guadalquivir accounts for four times as many as the Camargue. While Table I and the last three paragraphs have dealt broadly with the Guadalquivir delta as a whole, the remainder of the discussion relies more on the Coto Doñana list once again.

It would be rash to use such a table in argument on the respective merits of the two areas, since it only purports to give species which have an established status during the breeding season, to which available reasonably comparable data relate. Many of the common species and rarities which may be freely seen on migration or even making prolonged stays do not figure on this list at all. Moreover, certain birds which figure on both lists—such as the Purple Heron, Flamingo, Gull-billed Tern, Roller, Hoopoe and Great Reed Warbler—are in fact much more numerous and easily seen in the Camargue, while others—such as the Squacco Heron, Pratincole and Great Spotted Cuckoo—are much more widespread and conspicuous in the Coto. In addition, the situation in both areas varies greatly from year to year, and species which are abundant one season may be hard to find the next, while major colonizations and extinctions appear to be occurring at a surprising rate. The Camargue seems to have gained the Black Kite, Pratincole, Great Spotted Cuckoo, Bee-eater and Roller only in fairly recent years, although some of these may have been previously missed or have recolonized after temporary disappearances. On the other hand, if past records are to be credited, the Marbled Duck, Purple Gallinule and Crested Coot were formerly in the Camargue, but have recently died out, and the Glossy Ibis is now represented only by single stragglers. The Coto has also nearly lost the Glossy Ibis, and seems gradually to be losing its Flamingos, but it has gained, for instance, in large birds of prey—and in the Azure-winged Magpie, of which there were none south of Seville fifty years ago.

Both the Coto and the Camargue are seeing disturbing increases in populations of species representing a threat to other members of the avifauna, such as Jackdaws, which do much damage by being quick to dash in and take eggs of herons and other species which have temporarily left their nests exposed, especially when flushed by intruders. Owing to this situation it is possible for a bird-watcher, perhaps without realizing it, to leave a colony which he has visited more thoroughly stripped of eggs than if it had been pillaged by some of the most ruthless human egg-collectors. It is such hazards which make the greatest consideration and discretion essential in visiting the last remaining strongholds of many rare species. In the Camargue the spread of widely scattered pairs of Herring Gulls appears to be a grow-



ing menace, and it is feared that a large proportion of the attractive little Scops Owls have been killed recently through giving themselves away by their calls to the newly colonizing and much larger Tawny Owls, which do not hesitate to prey on their cousins. Other factors such as changes in salinity and land reclamation have benefited certain species, but have pressed hardly upon others.

Although so many species are common to the Camargue and the Coto, there are certain conspicuous differences. The Coto is outstandingly richer in species and numbers of diurnal birds of prey, of which eight species on its list do not earn a place on the Camargue list. It also shows a greater variety of herons, ducks, larks and warblers. Against this the Camargue can show definitely greater variety in such groups as finches, buntings, martins and tits, among which the Penduline Tit is outstanding as a Camargue bird missing from the Coto. For practical purposes, however, the situation is rather different, since the Flamingo no longer breeds in the *marismas* and is difficult to see there to advantage, and for Purple Herons, Red-crested Pochards and Rollers the Camargue offers far greater assurance of successful watching. By contrast, some of the special Coto species, such as the Purple Gallinule and Crested Coot, are extremely difficult to locate and observe, and the year-to-year fluctuations and shifts in the Coto are even more bewildering and difficult to keep up with than in the Camargue. Anyone who wishes to see a rich variety of southern European birds with reasonable certainty and comfort and in a limited time would do far better in the first place to go to the Camargue region, especially during late April and May when (unless the *mistral* proves unpleasantly persistent) the conditions can normally be expected to be excellent, and different areas with quite different bird populations can, if desired, be visited every day for a couple of weeks.

All Europe would be the poorer if either of these remarkable regions were to be invaded or damaged by unsuitable development. Fortunately both in France and in Spain the needs and the dangers have been fully recognized by wise, vigorous, and vigilant men who are well placed to watch over the welfare of both the Camargue and the Coto. In continuing to do so they will deserve to be encouraged by the expressed confidence and support of Europe's ornithologists, and to be helped positively in such ways as they may ask and negatively by being spared thoughtless actions which make their task more difficult. In the Camargue the main burden rests on M. Roger de Vilморin, President of the Société d'Acclimatation and Monsieur G. Tallon, Director of the Reserve Zoologique et Botanique de Camargue, and on Dr. L. Hoffmann, Director of the Station Biologique de la Tour du Valat. In the Coto the responsibility is equally excellently carried out by Don Mauricio González Díez on behalf of his fellow proprietors (it must be emphasized again that the Coto Doñana, owned jointly by three great Spanish families, is a completely private property). It is a great piece of good fortune for science

and conservation that key areas of both these regions should be in such strong and capable hands.

#### ACKNOWLEDGEMENTS

We wish to take this opportunity of expressing our gratitude to Dr. Luc Hoffmann and his colleague Monsieur R. Lévêque, who together compiled a Camargue list on which we have based that column of our table; to Dr. Hoffmann, Don José Antonio Valverde, and Messrs. Guy Mountfort, John Naylor and G. K. Yeates, also Dr. R. J. Raines and Mr. Eric Simms, for reading this paper in draft and proof, and for making many useful criticisms without which the result would have been considerably less complete than it is; to Messrs. Eric Hosking and G. K. Yeates for providing the majority of the photographs of the Coto Doñana and the Camargue respectively, which appear on plates 69-80; to Dr. H. M. S. Blair for translation, extraction of data, and criticism; to Miss P. B. Lind for much help in compiling the list of alternative places in Spain where most of the Coto Doñana birds may be seen; and particularly to Mr. B. H. Grimes for his skill and enthusiasm in preparing the comparative maps of the two areas.

Less directly, but no less greatly, we are indebted to Dr. Hoffmann, Monsieur H. Lomont and others for guiding and helping us in our observations in the Camargue; to Mr. Mountfort for organising and leading the Coto Doñana Expeditions of 1952, 1956 and 1957, our membership of which enabled us to make the observations on which this comparison is based; and most of all in the Coto Doñana to Don Mauricio González Díez for his great kindness and hospitality in each of these years, and for his unflinching help in overcoming many difficulties, both ornithological and otherwise, over long periods in the field. A full account of the Coto Doñana Expeditions will be provided by Mr. Mountfort's forthcoming book *Portrait of a Wilderness*, to be published in the spring of 1958.

(A note on sources of information will appear at the end of this series on the Camargue and the Coto Doñana.)

## MIGRATIONS OF THE OYSTERCATCHER IN THE AREA OF BRITAIN : RESULTS OF RINGING

By E. J. M. BUXTON

THERE are now enough records of recoveries of ringed Oystercatchers (*Haematopus ostralegus*) to justify an attempt to draw some conclusions about their migrations. In this paper all records of Oystercatchers ringed in the British Isles, wherever recovered (including four ringed under the Aberdeen University scheme),

and all records of Oystercatchers ringed elsewhere but recovered in the British Isles are taken into consideration. I have included all that have been reported up to 28th February 1957.

Probably a considerable number of Oystercatchers bred in Iceland and the Faeroes visit the British Isles, but birds from Continental Europe comparatively seldom come here. There are records of 5 birds from Iceland, 13 from the Faeroes, but only 2\* from Norway, 1 from N. Germany, and 2 from Holland. Large numbers of Oystercatchers have been ringed in Germany and Holland and also in Sweden.

The great majority of records are of birds ringed as young before they can fly. Unfortunately, owing to the soft metal used in British rings until very recently, there are few records of British Oystercatchers of more than two or three years old. The Oystercatcher is a very long-lived bird, as Drost and Hartmann (1949) and Jungfer (1954) have shown: in the German colony which they studied, several birds were over 20 years old and one was 27 (see Linzen, 1954). The oldest British Oystercatcher so far recovered was 10 years and 2 months old. The ring on one bird recovered after only two years was already partly illegible. The British records cannot therefore be used as evidence of longevity.

With the exception of two birds ringed as full-grown (see page 522), I have rejected all reports of the ring only, of the leg only with a ring, of a gull's pellet containing a ring, or of a decomposed carcase or skeleton of a ringed bird, since none of these can be dated accurately, and for some the place where the bird died may be a considerable distance from the place where the ring was found.

The majority of Oystercatchers are ringed as chicks in June or in early July. They take about five weeks to fledge, so that in August many young birds are not yet independent but are still near the place where they were hatched. However, there is one record of a bird flying 960 miles from its birth-place in its first August: from Fair Isle to Cap Ferret in France, which is almost the longest flight recorded. There are other distant recoveries in the first August after hatching, which suggests that the birds begin to disperse as soon as they are independent. Table I shows this dispersal for the first two years and nine months of life. Oystercatchers do not breed until their third summer (Dirksen, 1932), so that there is no reason to expect them to return near to their birth-place until after the third winter. There is some indication in the records that immature birds may be further away in their first year than in their second, since the only bird found more than 600 miles away in its second or third year is the one certainly Norwegian-bred bird recovered here, which may be exceptional. They begin to return to the breeding-area

\*One of these was ringed in October as an immature bird, and may therefore have been bred outside Norway, perhaps in Iceland or the Faeroes.

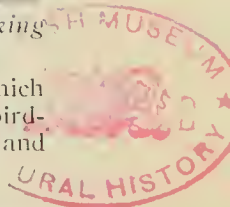




Eric Hosking

BARE MOBILE SAND-DUNES: COTO DOÑANA, MAY 1957

This shows a typical loose escarpment of the large mobile dune ridges, which reach heights of 100-300 feet (see page 511). These dunes are poor for bird-life, but their edges make good hunting-grounds for Short-toed Eagles and Black Kites feeding on snakes and lizards.



Eric Hosking

MATURE DUNE PLATEAU WITH PINES AND SCRUB: COTO DOÑANA, MAY 1957

Behind the coastal dunes the sand is partly stabilized by stone pines and *Halimium*. This, the area of Charco del Toro, is the habitat of Imperial and Short-toed Eagles, Black Kite, Hobby, Stone Curlew, Red-necked Nightjar, Thekla Lark, and Orphean and Sardinian Warblers (see page 511).



*Eric Hosking*

DRYING OPEN MARISMAS: COTO DOÑANA, MAY 1956

This gives a good idea of the shallower flooding, with mud and sparse *Salicornia*. The latter clumps form the breeding-places of Yellow Wagtails and Black-winged Stilts, while Kentish Plovers, Avocets and Short-toed Larks favour the drier islands (see page 512).



*Eric Hosking*

FLOODED OPEN MARISMAS: COTO DOÑANA, MAY 1956

Here one is looking across deeper flooding, with sedge and water crowfoot, to the Palacio de Donana among planted eucalyptus trees. This sedge zone holds the colonies of Whiskered and Black Terns; also Coots and Little Grebes, and some Crested Coots and Black-necked Grebes.





G. K. Yeates

## THE MARAIS DE LA SIGOULETTE: CAMARGUE, MAY 1947

This illustrates a blend of open water, rushes and tamarisks that forms a typical Camargue habitat of the Whiskered Tern, rather different from that of the Coto Doñana (*cf.* plate 70 lower). This area is maintained in this state by the activities of the bulls (see page 510).

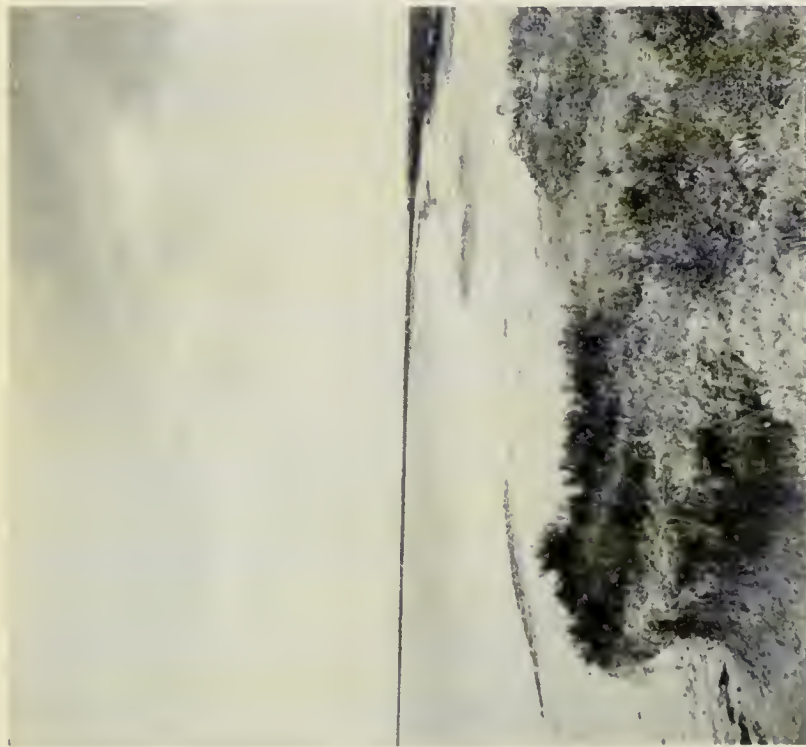


G. K. Yeates

## THE MARAIS DE LA SIGOULETTE: CAMARGUE, MAY 1947

Another view of the same area shows a typical brackish pool of the Camargue. Great Crested and Little Grebes, Marsh Harriers, Red-crested Pochards and various other ducks breed on this *marais*, and many migrant waders and foraging Night and Purple Herons may be seen (see page 510).

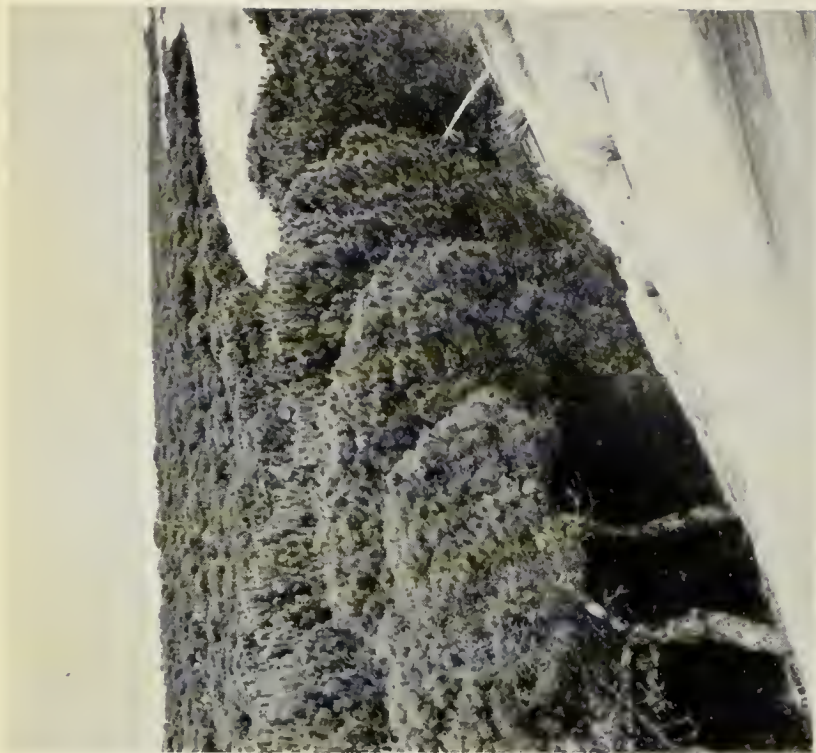




RIVER GUADALQUIVIR AT BRENES

Coto Doñana Area, May 1957

On the left is shown a typical view of the river, looking south along the right bank towards the ridge of pine-clad coastal sand-dunes near the mouth. In the foreground are tidal mud-flats (the haunt of vast numbers of migrant waders) and the natural unembanked fringe of the *marismas* (see page 512), the latter clothed in *Salicornia* which here forms a particular unembanked fringe of the Lesser Short-toed Lark. The right-hand picture shows the pine-wood habitat of the Azure-winged Magpie (and of other birds, from Black Kite to Goldfinch) in the course of being buried by advancing mobile sand-dunes over 50 feet high (see page 511).



PINE-WOODS OF CORRAL DE LA CITA  
E. M. Nicholson





*Eric Hosking*

PART OF THE GREAT HERON COLONY: COTO DOÑANA, MAY 1956

Here one can see Cattle Egrets and rather fewer Little Egrets, both appearing completely white, though the latter are easily distinguishable by their less plump shapes and much longer bills. In good years this colony (see page 511) has a population of some 7,000 pairs, comprised chiefly of about equal numbers of these two species, but also lesser quantities of Night Herons (of which one is shown here, top left) and a scattering of Squaccos, as well as Common Herons and White Storks, so that by early July there are, with the young, over 30,000 birds in a few acres.





Eric Hosking

LITTLE EGRETS AND A CATTLE EGRET: Coro Doñana, May 1956

At this range the two species are easily distinguished by the long black bills, all-white bodies and fine plumes of the Little Egrets, compared with the other's stubby pink beak, stocky shape and buff feathering on crown (also on mantle and breast). Whereas most of the Camargue Little Egrets and Night Herons build in trees, the big Coto colony is mainly located in tree-heath and bramble, so that the majority of the stick nests are only some 3-8 feet above the ground (but see plate 76 lower). Other Guadalquivir colonies,

however, are in reeds and small trees

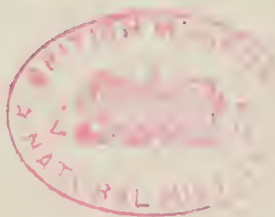




*Eric Hosking*

SQUACCO HERON AT NEST IN BRAMBLE: COTO DOÑANA, MAY 1956

With its golden-buff plumage, long white crest-feathers edged with black, and (at this season) reddish legs and black-tipped blue bill grading into emerald green around the eye, this is one of the most attractive of the small herons. It is also usually one of the least numerous and in this particular colony forms about one-hundredth of the total. It feeds particularly in the lush water-meadows, chiefly on aquatic insects. The one other species particularly connected with the herons, and parasitic on their eggs, is the Jackdaw.





*Eric Hosking*

NIGHT HERON AT NEST IN BRAMBLE: COTO DOÑANA, MAY 1956

Chiefly tree-nesters in the Camargue, these handsome, if stolid, grey, black and white birds with vivid red eyes are on the Coto more commonly found breeding in the thickets, as here, or in rushes in the *marismas*. Largely crepuscular, they are little in evidence by day away from the colonies.



*Eric Hosking*

"PARK-LAND" WITH CORK OAKS AND SCRUB: COTO DOÑANA, MAY 1956

This is typical of the north-west of the Coto proper: a flat plain of *Halimium* 3-5 feet high, dotted with gnarled cork oaks that rise to 30-50 feet. These particular oaks hold a tree-nesting part of the great heron colony (cf. plate 74) and are sprinkled with White Storks and Little Egrets.





*Eric Hosking*

THE LUCIO DEL MEMBRILLO: COTO DOÑANA, MAY 1957

This shows the meeting of flooded *marismas* and low pine-clad sand-dunes that takes place towards the southern end of the Coto. The water here is the haunt of Marbled and other ducks, and feeding Flamingos; while the pines hold Azure-winged Magpie, Orphean Warbler, etc.



*Eric Hosking*

THE LAKE AT CHARCO DEL TORO: COTO DOÑANA, MAY 1956

This is one of the smallest of the fresh-water lagoons that stretch across the mature dune plateau from near the sea to the *marismas*. This reed-bed is the breeding-ground of White-headed Duck, Coot and Crested Coot, and a similar bed on another lagoon holds Purple Herons (see page 511).





*Eric Hosking*

HORSES CROSSING CHANNEL IN DRYING MARISMAS: COTO DOÑANA, MAY 1956  
certain channels hold water long after the rest of the *marismas* are dry and result in great concentrations of animal life.



*Eric Hosking*

BLACK-WINGED STILTS FEEDING IN MARISMAS: COTO DOÑANA, MAY 1956  
Well out in the open *marismas*, these stilts give some indication of the varying depth of water, and of the height of the sedge in the background.



*Eric Hosking*

CATTLE EGRETS IN RANK HERBAGE: COTO DOÑANA, MAY 1957  
These birds feed largely on frogs and insects, and may often be seen in rank grass and sedge. The background *juncus* that divides the *marismas* from the sand-dunes is a habitat of Fan-tailed Warblers and fewer Savi's Warblers.



*G. K. Yeates*

FLAMINGOS MASSED ON ISLET: CAMARGUE, MAY 1947  
A typical view of a long line of Flamingos on the alert with their long necks fully extended, so that some are noticeably taller than others.



*G. K. Yeates*

FLAMINGOS FEEDING IN OPEN WATER: CAMARGUE, APRIL 1938  
These birds are near the edge of the Étang de Vaccarès, a vast shallow lake (see page 510). Smaller open stretches are also found in the *marismas*, but are much more difficult of access.



*G. K. Yeates*

FEMALE KENTISH PLOVER AT NEST: CAMARGUE, APRIL 1937  
Vast areas of bare dry mud are characteristic of both deltas as the winter water recedes. Taken on the eastern shore of Vaccarès, this shows the Kentish Plover's tendency to lay its three eggs by some small land-mark.





G. K. Yeates

PRATINCOLE ON NEST: CAMARGUE, MAY 1947

Taken at Les Grandes Cabanes, this shows a nest-site typical in the Camargue and frequent in the Coto: a slight hollow by a clump of sparse and stunted *Salicornia* in an area of bare, cracked mud. Stone Curlew, Lapwing, Kentish Plover, Yellow Wagtail and Tawny Pipit share this habitat (see page 510).



G. K. Yeates

GULL-BILLED TERNS ON GROUND: CAMARGUE, JUNE 1950

This photograph was taken on an islet in the Etang de l'Arameau (Petite Camargue) and shows a habitat common to both deltas, though the Gull-billed Tern is much less numerous on the Coto *marismas*: bare mud and *Salicornia* with the open saline water close by (the light strip below the skyline vegetation).



TABLE I—RECOVERIES OF IMMATURE OYSTERCATCHERS (*Haematopus ostralegus*)  
("Immature" here means all that have not passed the February of the third year from birth. The figures in brackets include those recovered in the first August or September when late or weak birds would hardly have had time to get far.)

Year of life	Month	Distance from birth-place in miles										Totals
		Up to 100	101-200	201-300	301-400	401-500	501-600	601-700	701-800	801-900	901-1000	
1	August	(15)			1	1	1				1	4 (19)
	September	(13)		3	4	1			1	1		10 (23)
	October	7			4	1	2				1	15
	November	1	2		1	1					1	6
	December	4	2	1			2					9
	January	6	1	1	1	2	2		1			14
	February	1		2	1	2						6
	March	8		4	1		1					14
	April	3	1	2	1		1				1	9
	May	2			2		1					5
	June											0
2	July	1		1	1							3
	August											0
	September	1	1									2
	October		1	1								2
	November	1				1	1					3
	December	2	2									4
	January			4		1	3					8
	February	2	1	1		1						5
	March		1		1							2
	April											0
	May		2			1						3
	June											0
3	July	1								1		2
	December	1										1
	January	1			1							2
	February			1		1						2
Totals		42 (70)	14	21	19	13	14	0	2	2	4	131 (159)

about February or March, and I have therefore taken the end of the third February as the end of the period of immaturity. Of 159 immature birds which have been recovered, 70 were found within 100 miles of their birth-place, but of these 28 were recovered in the first August or September when late or weak birds would hardly have had time to get far.

In Table II the records of adult birds have been tabulated by month of recovery and distance from their birth-place. Oystercatchers tend to return to breed in the area where they themselves were hatched (Jungfer, 1954), and of these 17 birds, which may be presumed to have bred or to be about to breed, only 8 were found more than 100 miles away, all in the months August to March. These few records may perhaps suggest that mature birds do not move so far away from their breeding area as immature birds. This is of course a well-known phenomenon in some other species which

TABLE II—RECOVERIES OF ADULT OYSTERCATCHERS (*Haematopus ostralegus*)  
 ("Adult" here means all that have passed the February of the third year  
 from birth.)

Month	Distance from birth-place in miles							Totals
	Up to 100	101- 200	201- 300	301- 400	401- 500	501- 600	601- 700	
March	1					1		2
April	2							2
May	1							1
June								0
July								0
August	1	1				1		3
September								0
October								0
November								0
December	1		1				1	3
January	1		2					3
February	2			1				3
Totals	9	1	3	1	0	2	1	17

do not breed in their first year. The following few records of birds ringed as full-grown (not necessarily mature) support this suggestion.

A bird ringed 30th September 1956 at Shellness, Isle of Sheppey, was recovered there 27th January 1957.

A bird ringed 21st September 1952 on Hilbre Island, Cheshire, was only across the other side of the Dee on 13th March 1953, a flight of 15 miles which it might well have done daily.

A bird ringed 28th May 1954 on Fair Isle was 70 miles S.W. at Deerness, Orkney, on 23rd January 1955.

A bird ringed 20th June 1949 in the Faeroes was found at Luce Bay, Wigtownshire, on 14th January 1951, a flight of some 500 miles.

A bird ringed 29th May 1954 on the Isle of May was found there in a decomposed state in November 1955 (presumably it had not been dead more than a few weeks).

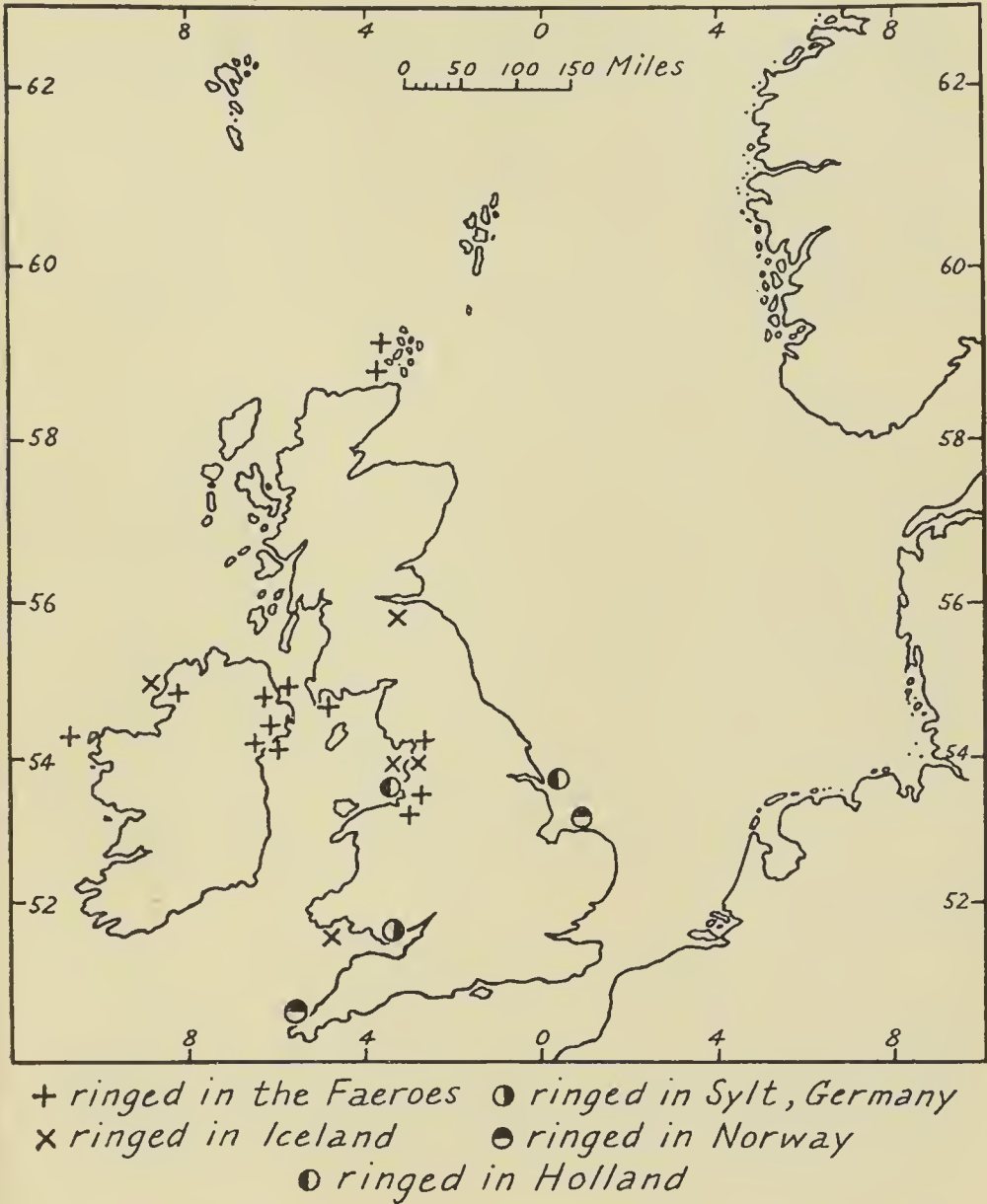
There is also the record of the finding of the leg of a bird ringed 19th January 1955 at Avoch, Ross-shire, 11 miles to the N.E. at Nairn on 10th September 1956.

Of these six birds only one seems to have travelled any great distance from its presumed breeding area.

Map I shows the place of origin of birds ringed outside the British Isles but recovered here. I have not shown on a map the places of recovery abroad of birds ringed in the British Isles, since many of these have flown shorter distances than others have flown within the British Isles. All British Oystercatchers recovered abroad have been found on the Channel or Biscay coasts of France except for one which was reported from the north-west coast of Spain. There is also a considerable movement from Scotland to Ireland. The records do not show wintering areas, but areas in which immature birds may be found at any time of year.

In conclusion, it seems probable that most young Oystercatchers (but by no means all), soon after they become independent, move

off quite fast up to about 1000 miles south of their birth-place, though the majority go from 200 to 400 miles only; that thereafter



MAP 1—BRITISH RECOVERIES OF OYSTERCATCHERS (*Haematopus ostralegus*) RINGED ABROAD, TO SHOW PLACES OF ORIGIN

they remain away until their third spring, and only then begin to move back to the neighbourhood of their birth-place, where they themselves will begin to breed in their third summer. Subsequently, for the rest of their lives, they will tend to remain in this area, and it will be exceptional for them to go as far away as they go while immature. There is little evidence of any northward return before the third spring.



I am most grateful to Sir Landsborough Thomson for his criticism and suggestions.

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## ICELANDIC BLACK-TAILED GODWITS WINTERING IN IRELAND

By KENNETH WILLIAMSON and ROBERT F. RUTTLEDGE

THE BREEDING DISTRIBUTION of the Black-tailed Godwit (*Limosa limosa*) in Europe extends over most of the Continent from Denmark and southern Sweden in the north, to France (Vendée) in the south and Russia in the east. According to Witherby *et al.* (1940) these birds winter in the Mediterranean region and North Africa. There is an isolated population breeding in western Iceland, 800 miles from the nearest Continental birds, and this has been described as a distinct subspecies, *Limosa limosa islandica* Brehm 1831. It is migratory, but its winter-quarters are unknown, though Salomonsen (1935) has suggested synhiemy with the typical race. The characteristics of *islandica* include a redder breeding-dress and shorter bill, sex for sex, than in *limosa*, the measurements given by Salomonsen (*op. cit.*, p. 84) showing very little overlap. viz.

Bill-length in *limosa*: ♂♂, 83-99 mm; ♀♀, 101-121 mm.  
 „ „ *islandica*: ♂♂, 76-85 mm; ♀♀, 85-100 mm.

Witherby *et al.* did not accept this race, but its distinctness has recently been confirmed by the B.O.U. Taxonomic Sub-Committee (*Ibis*, vol. 98, p. 161). Very few British examples are known (though doubtless the critical examination of museum collections would bring more to light), and these give scanty information on its status in this country.

Wintering of Black-tailed Godwits takes place in the British Isles, and thanks to the researches of Morley and Price (1956) much is now known concerning numbers and distribution. But there is still no relevant information as to the sub-specific identity of these birds. In winter, as they and also Kennedy, Ruttledge and Scroope (1954) have shown, there is a big concentration in Ireland, particularly in the Shannon estuary. Subsequent enquiries have elicited the information that a flock of *ca.* 500 was present at the North Slob, Co. Wexford, on 8th January 1955 (*Irish Bird Rep.*, 1955, p. 13); whilst the normal wintering population at Clonakilty and Rosscarbery Bays, Co. Cork, has been estimated at 275-300 and *ca.* 25 respectively (*idem*, 1956, p. 11). We

strongly suspect that there is, in fact, a heavier concentration in Cos. Wexford and Cork than in the Shannon Valley. In view of what we have learned in recent years about the cyclonic drift-pattern of Iceland and Greenland birds entering western Britain on autumn migration (see Williamson, 1953), it seemed possible that these Irish winter flocks might be identifiable with *islandica*.

Since plumage examination is no guide outside the breeding-season, it was clear that an enquiry into their status would need to be restricted to bill-measurement. One of the authors visited the National Museum of Ireland in Dublin and recorded the bill-length of the 15 Irish-taken examples in the collection. An analysis of these, given in Table I, shows that with only two exceptions the birds are either certainly (10 cases) or probably (3 cases) *islandica*.

TABLE I—BLACK-TAILED GODWITS (*Limosa limosa*) IN THE NATIONAL MUSEUM OF IRELAND

No.	Date captured	Locality and sex (ex label)	Bill (mm.)	Remarks
A) <i>Limosa limosa islandica</i> .				
	14.i.1941	Ireland, ♂	82	
	no date	Tralee, Kerry, ♂	75.5	Immature
	9.viii.1901	Rosslare, Wexford, ♂	80	Partial summer plumage
	-x.1911	Wexford, ♀	79.5	Bill 9 mm. less than ♀ minimum—see NOTE below
	25.ii.1928	Hook Tower, Wexford, ♀	94.5	
	25.ii.1928	Hook Tower, Wexford, ♀	77	
	1.vii.1918	Lough Ree, (Ros- common/West- meath), ♀	77	Bill 8 mm. less than ♀ minimum—see NOTE below
	8.v.1915	Rathcubbin, Birr, Offaly, ♀	80.5	Bill 5 mm. less than ♀ minimum—see NOTE below
	no date	Queen's Co. (Leix), ♂	82.5	Summer plumage
	no date	Tralee, Kerry, ♂	77	Juvenile
NOTE: It is highly probable that nos. 4, 7 and 9, being so much smaller in bill-measurement than ♀♀ of either race, are wrongly sexed. Even so the measurements are below those for ♂ <i>limosa</i> .				
B) <i>Limosa limosa limosa</i> .				
	13.xi.1896	Queen's Co. (Leix), ♂	95	
	September	Co. Meath, ♂	93	
NOTE: These, if wrongly sexed, might be either ♂♂ <i>limosa</i> or <i>islandica</i> .				
C) Indeterminate.				
	1.vii.1918	Lough Ree, (Ros- common/West- meath), ♂	83	
	no date	Tralee, Kerry, ♂	84	
	Aug. 1927.	Hook Tower, Wexford, ♂	84.5	
NOTE: Probably all <i>islandica</i> , as 83 mm. is the minimum for ♂♂ <i>limosa</i> .				

It would thus appear that the great majority of the Black-tailed Godwits which winter in Ireland belong to the Icelandic race, and in view of their high density there it may well be that Ireland is the winter-quarters of the bulk of the Icelandic population.

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## OBSERVATIONS ON BROODS OF NUTHATCHES LEAVING THE NEST

By M. C. RADFORD

IN 1953, 1956 and 1957 I was able to watch the actual departure from the nest of a brood of Nuthatches (*Sitta europaea*). On each occasion the birds had been reared in a nest-box on the trunk of a tree in our garden at Oxford. The nest box was hollowed out of a bough of elm, with an entrance hole  $1\frac{1}{4}$  inches in diameter. In 1953 the box was on a Japanese cherry, in 1956 and 1957 on an oak, in each case about 7 feet from the ground.

On 27th May 1953 a young Nuthatch was visible all day at the mouth of the hole, so the next morning I began watching the box at 5 a.m. (B.S.T.). At 5.50 a.m. the first young emerged and went straight in again. This happened 3 times. On the fourth occasion a parent arrived, whereupon the young bird fluttered down to the ground and immediately climbed up into the tree. The other four young followed rapidly. Three were out by 6.15 a.m. and the last two by 6.20. They all emerged quickly and at once climbed up into the tree. By 7 o'clock they had all flown into neighbouring trees, flying quite strongly.

On 3rd June I examined the box: it contained only a mass of pieces of bark, with no eggs, and was completely clean.

On 24th May 1956 a young Nuthatch was visible at the hole and again I watched on the morning of 25th May from 4.45 a.m. (B.S.T.). There was no sign of life until 4.55 when the youngster appeared and feeding began. There were 10 visits in 15 minutes and on one occasion a faecal sac was removed. At 5.12 one parent, carrying food, remained on the box below the hole for a minute, but did not feed the young. At 5.15 the first youngster clambered out and down the box, then fluttered to the ground and immediately climbed up the tree. No other bird was seen at the hole until 8.40 when I left for 20 minutes. At 9.0 the second youngster was out clinging to the side of the box; then it scrambled on to the top and up into the tree.



Both these birds were much more immature than those of the 1953 brood and their actions much less vigorous. They flew feebly to the ground and climbed up into a rose arch—there to be fed. They did much preening and fussing with their feathers. No other young emerged and on examining the box on 26th May I found it to be rather foul with grubs and insects and there were two small corpses, probably about 1 or 2 days old.\*

In 1957 feeding began on 3rd May, and on 20th May one young was seen at the hole. At 5 a.m. (B.S.T.) on 21st May the first young was again at the hole. The parents visited 12 times in 30 minutes and twice removed a faecal sac. At 6.02 this first bird came out head downwards, climbed down a few inches, turned, got on top of the box and then climbed rapidly up into the oak. At 6.05 the second followed and did the same, except that from the top of the box it flew strongly away. No. 3 came out at 6.10 and behaved exactly like No. 2. No. 4 emerged at 6.12 and, like the others, climbed a few inches down the box, turned, climbed on top of the box, and then, like No. 1, went rapidly up into the tree. Nos. 1 and 4 were watched climbing vigorously about, pecking at the bark and finally flying off.

Later examination of the box showed the usual bark, spotlessly clean, but there was one infertile egg and one broken one deep down among the pieces of bark.

In 1953 and 1957 I was impressed by the vigour and maturity of the fledglings both in climbing and flying—for which, obviously, life in a nest-box can give no preparation. They also immediately began pecking at the bark of the tree they were on. In 1956 for some reason—possibly the quantity of insects in the nest and presumably among their feathers (as the constant preening,

\*This is a most interesting observation because it seems most likely that the "grubs" mentioned were the larvae of *Protocalliphora azurea*, one of the two British parasitic flies which lay their eggs in birds' nests, so that when the larvae hatch they periodically attach themselves to the nestlings and suck their blood (see *antea*, vol. xlvii, pp. 236-243; vol. xlviii, pp. 225-229). This cannot be regarded as certain, however, because—as Mr. D. F. Owen has commented (*in litt.*)—there are several other (non-parasitic) species of Calliphoridae which might infest a nest once the young had died (though they would be unlikely to do so while the nestlings were alive); more particularly, there is the possibility of the other parasitic species known to behave similarly to *Protocalliphora*, i.e. *Neottiophilum praeustum* (*antea*, pp. 160-164). In his paper on the latter, however, Mr. Owen pointed out that, of the two, *Protocalliphora* is much more frequently found in the nests of birds which breed in holes (as in this case) or which build particularly compact structures. In addition, there are several records (referred to in the papers already mentioned) where one or more of the brood of nestlings has died (as possibly happened here) as a result of a particularly heavy infestation of *Protocalliphora*, but there is little evidence of this with *Neottiophilum*. Neither species has yet been recorded from the nests of Nuthatches, which are normally remarkably clean, while the pieces of bark with which they are lined do not appear particularly suitable for parasites. It is hoped that ringers and others who have occasion to examine the nests of Nuthatches in nest-boxes will look out for these flies.—Eds.

mentioned above, suggests)—the 2 youngsters were very feeble and ill-equipped to face the world. In the case of the two healthy broods, it is interesting to note that whereas the first young seemed to hesitate for some time before taking the plunge and emerging (in one instance going back 3 times), the others all followed very rapidly.

The only reference to a comparable observation on nuthatches, that I have been able to find, is one made by J. Eugene Law and recorded by Bent (1948). It concerns the Black-eared Nuthatch (*Sitta pygmaea melanotis*) which breeds in the entire Rocky Mountain region of North America, nesting in pines. In this Law describes how "a parent, grasping with its beak, seized a nestling by the shoulder, and after a rough tussle pulled the chick out and let it go fluttering to the ground. There, after a rest, during which parental solicitude obviously urged action, the fledgling fluttered along the ground to the base of a huge live pine and began to climb. A yard or two at a time, intervalled by long rests, it finally worked up . . . some 50 feet. The astonishing thing was that the fledgling elevated itself mainly by rapid fluttering of its wings . . . all the while pawing the bark furiously with its feet".

I have never seen a British Nuthatch attempt any such drastic action, and the Black-eared Nuthatch fledgling seems to have been barely ready to leave the nest.

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## SOME OBSERVATIONS ON BIRDS IN THE NORTH ATLANTIC

By HUGH IDRIS JONES

#### INTRODUCTION

THE month of August 1955 was spent aboard Ocean Weather Ship "Weather Recorder" in the North Atlantic at Ocean Station "India", 300 miles south of Iceland (59°0'N., 19°0'W.). Apart from three days towards the end of the period, when it changed owing to an S.O.S. signal being received and attended to, this position was maintained from 4th to 26th August.

Much of the time was spent on deck, but nevertheless it was inevitable that many birds would be missed, especially passing migrants at night and in the early morning. Time on deck varied, but visits were always made once an hour for at least ten minutes, and on some days the whole time, apart from meals, was spent there.

The numbers of each species, their directions of flight and the

weather, if considered relevant, and general behaviour notes are given. All times are Greenwich Mean Time.

#### POSITIONS

- 2nd August 1955: 0800 hours,  $56^{\circ}0'N.$ ,  $8^{\circ}40'W.$ ; steaming at 8-9 knots on a heading of  $295^{\circ}$ .  
3rd August 1955: 1400 hours,  $58^{\circ}0'N.$ ,  $15^{\circ}40'W.$ ; steaming at 8-9 knots on a heading of  $295^{\circ}$ .  
4th-18th August 1955: Stationary at  $59^{\circ}0'N.$ ,  $19^{\circ}0'W.$ .  
19th-20th August 1955: Steaming at 10 knots until 1100 hours on the 19th. Steaming around at 1-3 knots for the rest of that day and the 20th at position  $58^{\circ}20'N.$ ,  $16^{\circ}40'W.$ .  
21st August 1955: Steaming all day back to station.  
22nd-26th August 1955: Stationary at  $59^{\circ}0'N.$ ,  $19^{\circ}0'W.$ .  
27th August 1955: 0900 hours,  $58^{\circ}10'N.$ ,  $16^{\circ}10'W.$  (80 miles north-west of Rockall); steaming all day on heading  $115^{\circ}$  at 10 knots.  
28th August 1955: 0770 hours,  $57^{\circ}0'N.$ ,  $12^{\circ}20'W.$ ; steaming all day on heading  $115^{\circ}$  at 10 knots.  
29th August 1955: In the Clyde.

#### SEA BIRDS

LEACH'S PETREL (*Oceanodroma leucorhoa*).—The only record was one on 7th August.

STORM PETREL (*Hydrobates pelagicus*).—Seen only on four occasions: one on 7th, 20th and 27th August, and two on 28th August.

MANX SHEARWATER (*Procellaria puffinus*).—Apart from two on 3rd August and one flying east on the 12th, none was recorded until 14th August, but for the next eight days they were often seen. Sometimes they were just gliding around, presumably hunting, but all those that were flying on straight courses were going either east or west, probably from N. Scotland, moving to and from feeding-grounds farther afield. They were either single or in small parties, the most seen together being 25 on 16th August, flying low over the sea to the west.

GREAT SHEARWATER (*Procellaria gravis*).—On ten days none was seen at all, and on eight less than five were recorded. On four occasions, however, very scattered parties of over thirty birds, sweeping around low over the water, were noted; and on 25th August there was a raft of 80 sitting on the sea, with one or two Sooty and Manx Shearwaters and Fulmars amongst them. On most days they were not flying in any steady direction, and they did not often settle on the sea (except in the case of the raft already referred to).

SOOTY SHEARWATER (*Procellaria grisea*).—Never more than three were seen in a day, and they were usually flying around haphazardly, though the most constant direction was south. Often they consorted with Great Shearwaters if these were present.

FULMAR (*Fulmarus glacialis*).—No detailed work was done on the plumage of the Fulmars. For most of the month they were in old plumage with primary-, secondary- and tail-moult, and "moth-



eaten" wing-coverts, but by the fourth week of August there were many in immaculate new plumage.

The numbers present varied from one to 150, but were usually between 20 and 50. On steaming days and on the rougher days, the numbers were lower than on calm days, when the birds accumulated in flocks on the water. On these occasions the ship generally drifted away from them for two or three hundred yards before they took wing and caught up again. (Taking flight was difficult: often one would flap along the surface of the water for 20-25 yards and then give up.)

Probably each individual was with the ship, when it was drifting, for less than a day, but the only clue to this was gained by watching the movements of distinctive birds; there were few dark phase birds about, never more than two in a day, but not one ever stayed for a whole day. Also, at one time when a larger quantity of oil than usual had been pumped out of the ship, the majority of the birds present were oiled, mostly on the breast; next day none of these was to be seen. Similarly, a very light bird, whose wings were almost white, was only observed on one afternoon for a few hours.

There were no directions of flight at all: the birds just seemed to materialize from nowhere and then disappear. A peculiar habit frequently noticed was that, when on the water around the ship, they would suddenly, for no apparent reason, all fly up and after circling for a minute or two resettle on or near the original place.

They fed almost entirely on the refuse thrown overboard. On these occasions there was much bickering and cackling, and a sort of "peck-order" seemed to exist; at first, up to half a dozen Fulmars would hurl themselves in at a lump of meat, all squabbling. But within a minute a natural master would emerge, and the other birds would sit around quietly, watching him gorge. Any bird coming to within a foot would be driven off. Newcomers, attracted by the commotion, would fly straight down onto the meat, but soon be disillusioned and driven to the ring of spectators. If, however, there were too many birds, more than 8-12, total chaos reigned. Once a bird was seen to "duck-dive" to a depth of about two feet to retrieve a sinking scrap; it looked as if its wings were being used. If the food was distributed evenly over the water, the birds spread out into separate groups, and there was no central *mêlée*.

Skuas were the only birds to which the Fulmars showed any reactions. Once or twice a Great Skua, of which there were one or two on most days, tried to get the food from one of the scuffles already mentioned, by hovering above and dropping in. Usually when a Great Skua flew over, the Fulmars adopted the "busking" threat-posture, with head and tail thrown up and wings fluffed out and raised, but at these times it was ignored by the fighting Fulmars. When a Great Skua settled on the water near some Fulmars, it was often driven away, though the skua never

attacked them. Long-tailed Skuas, which were recorded on six or seven occasions and usually chased the Kittiwakes for a while, elicited threat-postures from the Fulmars; Arctic Skuas normally left them alone, but if one hovered above a Fulmar on the water, the latter adopted the "busking" posture. They were never seen to eject oil.

GANNET (*Sula bassana*).—One or two, both adults and immatures, were present on most days. Usually stayed for several hours, often settling on the water and occasionally diving.

ARCTIC SKUA (*Stercorarius parasiticus*).—Most birds were dark phase, and they appeared between 11th and 19th August. Almost invariably they stayed for several minutes, harassing the Kittiwakes and hovering above the Fulmars. They were first seen on the same day as the first terns, whose peak passage period was the same, and the terns were their chief victims; also like the terns, they were all flying in directions between south and west. Usually they came singly, but sometimes two together.

GREAT SKUA (*Stercorarius skua*).—This species was recorded on more than half the days, usually one or two that stayed for most or the whole of the day. Only once did a bird fly straight over, going steadily to the south at 35 feet. Often they rested on the water, and were sometimes chased off by the Fulmars. Once or twice Great Shearwaters were pursued; these would settle on the water, and presumably disgorge, for as soon as they took off again the skua would come down to the surface and appear to be feeding from it.

POMARINE SKUA (*Stercorarius pomarinus*).—On 9th August two went by separately to the W. or W.N.W., and on the 17th one went over to the E.S.E. on a steady course at 30 feet. On the next day one circled around for a few minutes, occasionally harrying the Great Shearwaters with a harsh cry.

LONG-TAILED SKUA (*Stercorarius longicaudus*).—One was seen on the morning of the 9th with the Pomarine, and that afternoon there were four present, settling on the water and hawking playfully after the Fulmars. Often they hovered just above the water and picked scraps from the surface with their bills. They left to the south or south-west. All had full-length tail-streamers. Between 0840 and 0925 hours on 16th August a party of 4 and three single birds flew by to the west; and between 0845 and 1000 hours on 20th August three went by to the north-east, close to the ship.

LESSER BLACK-BACKED GULL (*Larus fuscus*).—On the first day at sea two were present until 1000 hours. On 27th August, the day that we were relieved, one and later two were following the ship for much of the day, and at 1535 hours an adult and two immatures went by to the S.S.W. at 100 feet. From 1045 onwards on the 28th, up to 4 were present.

HERRING GULL (*Larus argentatus*).—On the first day at sea, up to 7 were present in the morning until 1300 hours, and then no more were recorded until 18th August when there was an immature Herring/Lesser Black-back for most of the morning; much of the time it was on the water.

KITTIWAKE (*Rissa tridactyla*).—Present on all days except two. They always came from the east, and circled the ship for some time before passing on. On most days up to three were present, and on two days two of them took to resting on a small platform by the lights at the top of the masts. On 11th and 12th August there were 23+ and 15+ together respectively; the first to arrive settled on the sea, and during the day the others came down and collected round this nucleus. They were mostly adults, and were once put to flight by an Arctic Skua. Rarely were they seen leaving, but on 14th August 7 adults and 2 immatures rose together and circled to about 200 feet; then, more scattered out, they flew off on a direct W.N.W. course, calling loudly. Normally they arrived at the ship at a height of 20-30 feet.

COMMON/ARCTIC TERN (*Sterna hirundo* or *macrura*).—(Not usually distinguishable, but though some were undoubtedly Arctics, no definite Commons were seen.) From 12th to 19th August was the peak period. They flew meanderingly, at heights of 15-60 feet, and their course was usually completely unaffected by the sight of the ship. Once two were watched chasing a Great Skua, though they were harried by the Arctic Skuas when the latter were present. The only time when they were seen feeding was on 12th August when 48 passed during the day; in the morning about 15 went by from east to west accompanying a large school of *ca.* 150 Pilot Whales (*Globiocephala malaena*) and dolphins (Delphinidae). The Terns fluttered down above the water and appeared to be feeding where it had been stirred up due to the cetaceans' breaking the surface. All flight-directions were between south and west; presumably they were on a migration route from Iceland. They were often heard calling around the ship at night, apparently in numbers.

PUFFIN (*Fratercula arctica*).—On 28th August one was seen on the water; position at the time, 57°0'N., 12°20'W.

#### NON-MARITIME BIRDS

ANATIDAE.—On 28th August a flock of ten small duck went by to the north-east at 100 feet, and soon afterwards a skein of *ca.* 50 geese flew by to the east, approximately one mile from the ship; position, 57°0'N., 12°20'W.

RINGED PLOVER (*Charadrius hiaticula*).—2nd August, 1130 hours, two overtook the ship flying north-west at 10-20 feet. Position 56°12'N., 14°W.; wind light, north-west.

TURNSTONE (*Arenaria interpres*).—All of these were still in summer plumage. At 1535 hours on 14th August a compact



flock of *ca.* 25 circled the ship a few times low over the waves, and went off to the east; wind light, west to north-west. On 20th August at 1300 hours 11 circled round low over the sea (see also under "Knot"); in the next three hours 1 + 1 + 2 + 1 flew by to the east or east-north-east, all of them just above the waves; wind south-west, 20 knots. On 23rd August two circled the ship, but it was not seen where they went; wind south to south-west, 15-20 knots. On 27th August two circled the ship, then rose to 120 feet and left on a direct course to the south-east. Three hours later another two circled round; they rose to 120 feet and looked as if they were going to leave at that height, but then came down and re-circled before leaving to the south-east low over the waves.

WHIMBREL (*Numenius phaeopus*).—On 18th August a party of nine went by on a direct course to the east, at 20 feet. The visibility was poor, but they were distinguished from Curlews (*N. arquata*) by their calls.

KNOT (*Calidris canutus*).—On 12th August one bird in winter plumage circled the ship a few times, as if it were going to land, but then flew away low over the water, probably to the west. On 16th August two went by within five minutes of each other, one in summer plumage, just over the water, to the south-south-west; wind light, south-west. On 20th August there was one winter bird with the party of 11 Turnstones.

DUNLIN (*Calidris alpina*).—On 18th August a compact party of 11 went by on a direct line to the south-south-west, just over the waves. (On this day these, the Sanderlings and the Whimbrel were all seen within an hour of one another, between 0840 and 0945 hours; the wind was south-west, 20 knots, then later in the day south-east and well above gale force.) On 19th August four probable Dunlin circled round, but their direction was not seen; wind south-west, 20-25 knots.

SANDERLING (*Crocethia alba*).—On 18th August one very weak bird kept around the ship for about 15 minutes and once or twice settled under the lifeboats. On 27th August three circled several times, but it was not seen in which direction they went.

#### PASSERIFORMES

WHEATEAR (*Oenanthe oenanthe*).—Three came aboard at about 0500 hours on 28th August, and were found on the bridge; one of them died, but the other two soon left. Position, at 0700 hours, 57°N., 12°20'W.; steaming at 10 knots on a course of 115°.

MEADOW PIPIT (*Anthus pratensis*).—On 28th August 11 were seen passing the ship or resting on it up till 1110 hours. Most, if not all, were birds of the year, and went to the south-east at 60 feet and once at 150 feet.

PIED/WHITE WAGTAIL (*Motacilla alba*).—On 27th August one circled us and the relieving ship, but it was not seen in which direction it left; position 58°0'N., 15°40'W. Six were recorded

the next day, some staying on the ship for several hours. They came from the west-north-west, and all those whose plumage was clearly seen were immatures.

#### ACKNOWLEDGEMENTS

I am grateful to Mr. James Fisher, who read the typescript of this paper.

#### SUMMARY

1. Observations made in August 1955, aboard Ocean Weather Ship "Weather Recorder" in the North Atlantic are listed in detail, together with the ship's positions and indications of the wind conditions.

2. There were only five records of small petrels; there seemed to be no correlation between the shearwater and Fulmar records and the weather. Most shearwaters, skuas and terns were between 12th and 20th August. There was evidence of skuas accompanying terns on migrations. Only one gull was recorded on station.

3. Of the five wader species on station, Turnstones were by far the most frequent. The number of waders increased towards the end of the month.

4. No Passerines were recorded from the station, but on the return journey several Pied/White Wagtails and Meadow Pipits were seen, also three Wheatears.

## FURTHER PARTRIDGE RECORDS FROM WALES

By COLIN MATHESON

THROUGH the courtesy of Mr. Paul Marriott, the agent for the Powis Castle estate, Montgomeryshire, I have recently been able to obtain the records of Partridges (*Perdix perdix*) and other species listed in the gamebooks for the Powis Castle and the Lymore estates (both situated within a few miles of each other in eastern Montgomeryshire), from the 1866-7 season up to the present time. These constitute the longest continuous run of records available to me with the exception of those supplied by Col. J. C. Wynne Finch for the Voelas estate, Denbighshire, and discussed in a previous paper (1953). It may be of interest therefore to tabulate and briefly compare the Partridge figures for both areas. In Table I, "Season 1866" means the shooting season 1866-67, and so on; "Powis" includes Lymore also.

While there are of course many discrepancies in detail, there is considerable correspondence between good and bad periods in these two series. If one takes the ten maximum bags recorded in

TABLE I—TOTAL BAGS OF PARTRIDGES (*Perdix perdix*) AT POWIS AND VOELAS, WALES, 1866-1950

Season	Powis	Voelas	Season	Powis	Voelas	Season	Powis	Voelas	Season	Powis	Voelas
1866	403	278	1887	726	1,052	1908	573	298	1929	260	44
7	281	180	8	327	131	9	255	227	1930	187	76
8	295	651	9	563	470	1910	351	182	1	31	24
9	733	710	1890	649	134	1	666	168	2	176	135
1870	834	372	1	429	164	2	88	39	3	267	244
1	526	182	2	450	196	3	162	112	4	287	349
2	139	69	3	863	301	4	551	233	5	265	453
3	210	103	4	452	144	5	414	375	6	119	140
4	68	303	5	726	124	6	42	154	7	142	337
5	131	279	6	1,713	468	7	33	319	8	107	54
6	177	699	7	1,375	705	8	50	134	9	178	49
7	347	398	8	815	333	9	91	142	1940	108	114
8	300	94	9	759	264	1920	12	15	1	166	147
9	75	58	1900	528	200	1	39	99	2	136	103
1880	205	91	1	476	474	2	54	25	3	70	83
1	367	193	2	378	152	3	54	101	4	44	32
2	254	151	3	278	70	4	30	43	5	9	46
3	287	164	4	381	340	5	273	143	6	27	20
4	565	320	5	767	430	6	336	135	7	—	13
5	525	400	6	317	325	7	35	40	8	40	8
6	322	257	7	16	81	8	57	4	9	60	14
									1950	142	8

each during these eighty-five seasons, the distribution is as follows :—

Powis  
(10 best seasons,  
1866-1950)

1869, 1870  
  
1887  
1893, 1895-99  
1905

Voelas  
(10 best seasons,  
1866-1950)

1868, 1869  
1876  
1887, 1889  
1896, 1897, 1901  
1905  
1935

At Powis, the figures for the mid-1930's, though never approaching the best seasons, do show for the first time in a considerable period a succession of three years (1933-35) in which the annual bag exceeded 250, and in this respect may be compared with the



figures for 1933-35 at Voelas. (In each of these same three years, it seems worth recording, the bag of Brown Hares (*Lepus europaeus*) at Powis was higher than it had been since 1885). A somewhat similar comparison holds for the seasons 1925-26 in both areas. But the peak period on the Voelas estate, and on some others, about 1876-77, has only a faint suggestion of a counterpart at Powis, in the figures for 1877.

As regards the worst seasons, the matter is complicated by one or other, or both, of the two World Wars, which are probably responsible, either during or immediately after the Wars, for very low bags which cannot be compared with those for normal times. But taking the six lowest bags in each series during the fifty seasons up to 1915, we have:—

Powis (6 worst seasons, 1866-1915)	Voelas (6 worst seasons, 1866-1915)
1872, 1874, 1875	1872
1879	1879, 1880
	1903
1907	1907
1912	1912

The 1903 bag at Powis, while not one of the six worst, was lower than it had been for twenty-one years.

The occurrence of a low or a high Partridge bag on an estate in any particular year may be influenced by various factors, including the possible tendency, previously mentioned (1953, 1956a), to a cyclic rise and fall in numbers among Partridge populations. One factor, weather-conditions at the breeding-period of the year, may have been particularly significant in some of the best or worst seasons quoted above—for example in 1879, which had the wettest summer (April-September inclusive) ever recorded over England and Wales (1956b).

The prolonged decrease in numbers of Partridges as compared with former times, though there is some suggestion of recovery at Powis in 1950, is evident in both sets of figures. Sir Gerald Trevor has sent me the Partridge records for Trawscoed Hall (also in Montgomeryshire) and adjoining farms for 1889 and 1890, which show 463 shot in the former and 556 in the latter season. He comments, "You will see that Partridge shooting was then quite worth while. Today they are almost extinct; only one was shot here last year" (i.e., in 1955).

#### REFERENCES

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## NOTES

**Gannets robbing gulls.**—On 5th August 1957, I spent the day at sea in Dingle Bay, Co. Kerry, in the trawler "Ros Brin". As soon as trawling operations began, we were accompanied by a few Storm Petrels (*Hydrobates pelagicus*), Fulmars (*Fulmarus glacialis*), Great Black-backed Gulls (*Larus marinus*), Lesser Black-backed Gulls (*L. fuscus*), and large numbers of Herring Gulls (*L. argentatus*).

During the gutting periods, and especially when any small waste fish were thrown over-board, six to eight Gannets (*Sula bassana*), would join in the feast. Any fish that sank too deep for the gulls were immediately taken by the Gannets by the normal manner of diving, but on numerous occasions when a gull sitting on the surface had a fish it could not swallow quickly—i.e. small plaice, dabs and other flat fish—one or other of the Gannets would plunge in a shallow-angled frontal dive at the gull, entering the water about two yards away and snatching the fish from the gull's bill on breaking the surface. The fish was swallowed on the surface. This was repeated many times, and the Gannets also frequently fluttered along the water and snatched fish from the bills of other gulls which they passed. On several occasions, too, a Gannet was seen to lunge into the air after a retreating gull that was attempting to rise from the water with a fish; the Gannet "treading water" with wings half-open and neck fully extended upwards in its endeavour to snap the fish from the slowly rising and heavily gorged gull. In this they were also successful. Immature Great, Lesser Black-backed and Herring Gulls were each in turn victimized, but only a few adults were attacked. The reason for this appeared to me to be the slowness of the immature birds, especially birds of the year, in swallowing the fish-food, and their inability to get out of the way quickly.

J. E. FLYNN

**Green Sandpiper uttering call of Wood Sandpiper.**—With reference to J. M. B. King's record of "Unusual call-note of Green Sandpiper" (*antea*, p. 168), I was twice misled during August 1957 by a Green Sandpiper (*Tringa ochropus*) giving the typical call of the Wood Sandpiper (*T. glareola*). Each time I was at a sugar beet factory pond near Lincoln and, as I saw the birds on the ground first, it happened that I was satisfied about their identity before I heard the call. On both occasions a party of Green Sandpipers rose together and I was most surprised to hear the "chiff-iff-iff" call of a Wood Sandpiper. The note was soon changed, or drowned by those of the other birds which were uttering the more usual "kler-wit" of the Green Sandpiper. As the birds soon settled at another pond close by, I was able to confirm my previous identification. When they were flushed a second time, only the typical Green Sandpiper alarm

notes were heard. From my knowledge of the species, the call I heard could not be confused with the "wit-wit-wit" mentioned in *The Handbook* (Vol. IV, p. 311). A. D. TOWNSEND

**A feeding method of Black Tern.**—About mid-day on 10th August 1957, at Woodspring Bay, between Weston-super Mare and Clevedon, Somerset, a single Black Tern (*Chlidonias niger*) in autumn plumage was observed feeding in a manner to which there seems to be no reference in *The Handbook*.

First seen over tidal mud and spartina grass, the Black Tern flew over the sea wall to an adjacent field of long rough grass and thistles where a few cattle were grazing. There it proceeded to fly up-wind, low over the herbage, picking food off the tops of tall plants every few yards. Reaching the windward end of the field it doubled right back down wind before beginning another foraging movement. This cycle was repeated some ten times before the tern returned over the sea wall, to disappear low over the mud bank towards the water's edge. In the next hour, however, this bird made two similar forages over this field, each of shorter duration than the first.

The actual taking of the food, which appeared to consist of insects, was accomplished by hovering for an instant with a quick downward movement of head and bill. R. ANGLES

**Display and posturing of the Cuckoo.**—On 6th May 1956, at close range from a car, I watched two female Cuckoos (*Cuculus canorus*) sitting on a fence at Aqualate, Staffordshire. A male, which had been calling near-by, alighted between them, causing one to flutter two or three yards away. This male then displayed at one of the females, but without calling and in addition to the usual postures (as described in *The Handbook*, Vol. II, p. 297) it rotated its tail in a large slow circle without moving the rest of its body, finishing with tail erect. This it did several times. It then flew down to the ground and returned to its perch with a dry leaf which it held for two or three seconds before flying to a wood near-by, calling repeatedly as it went. Next it returned to the second female and repeated exactly its previous display, after which all three birds flew away.

A previous note and editorial comment in *British Birds* (*antea*, vol. xlii, p. 152) refers to Cuckoos toying with twigs and grass when sexually excited, but I have not been able to find any reference to a soundless display or to the circular tail movement described above. W. G. LUTON

## REVIEWS

BRITAIN'S NATURE RESERVES. By E. M. NICHOLSON. (*Country Life*, London, 1957). 30s.

THIS BOOK is timely and valuable. Almost anybody with any interest in the subject at all knows that there are nature reserves



dotted about the map of Great Britain, yet few of us can have any clear idea of just how many there are or for what reasons each one is especially important. The book covers 87 reserves, 45 of which are treated in some detail, whilst the remainder (consisting generally of the less-important areas) are included in summarized form. It is encouraging to note that about half of the areas mentioned are National Nature Reserves, although Mr. Nicholson is generous in acknowledging the efforts of a number of bodies without whose help some of these areas would have vanished before the Nature Conservancy came into being.

Before dealing with the actual reserves Mr. Nicholson provides an introductory chapter which, without going into any great detail, discusses the needs for reserves, the many interests which they must cover, the purposes for which they can be used and some of the problems which confront those responsible for their management. We have mercifully progressed beyond the stage where a bird-sanctuary consisted of an area surrounded by barbed-wire and left to languish as best it might. Yet there is still a tendency to regard a reed-bed or a heath as there for all eternity if somebody does not drain the one or plough up the other. We still speak of too many crows, or Magpies or foxes often without the slightest scientific basis upon which to make such statements. Yet pending research it would seem ridiculous in most situations to tolerate such a ubiquitous egg-stealer as the crow in any numbers.

One or two minor, but curious, errors have crept into this book and the author seems to fight shy of the term "National Nature Reserve", referring to almost all of them as "Nature Conservancy Reserves". Surely Havergate Island is a "National Nature Reserve"? And Grassholm is an R.S.P.B. Reserve administered on their behalf by the West Wales Field Society.

It is a pity that the publishers could not have served the author better. The price of the book is expensive, considering that it has less than 100 pages of reading matter, and although it is liberally illustrated with an excellent selection of photographs, it was surely unnecessary to put on them both page numbers and plate numbers, particularly as the former often appear on a part of the picture. Plates 55 and 56 are two examples of this abominable and unnecessary practice. P.E.B.

THE BIRDS OF THE BRITISH ISLES. By D. A. BANNERMAN. Illustrated by G. E. LODGE. (*Oliver and Boyd*, Edinburgh, 1956). Vol. V. 350 pages; 34 colour plates. £3 3s.

THE FIFTH VOLUME is devoted to the birds of prey, and may prove to be the climax of this imposing work. Certainly, on looking back through the earlier volumes one realises that Mr. Lodge's style is particularly well suited to hawks, and here we are treated in several instances to two or three illustrations of a single species. This volume has a total of 34 plates depicting 25 species. To match this Dr. Bannerman has expanded his accounts of the birds

concerned, drawing heavily and with full acknowledgement from published material, and from the unpublished notes and knowledge of a team of supporters. The result is a fine book with much valuable information.

It has a particular fascination for those interested in the study of these birds abroad, as inevitably most of the observations recorded have been made outside this country, and they portray enticingly (or recall vividly) many wonderful scenes which cannot be encountered here. It is surprising, however, with so much space devoted to foreign observations, that there is little reference to the hawk migration in south Sweden, to which considerable attention has been paid in recent years by Rudebeck and others. Their figures for Buzzard, Sparrowhawk and Honey Buzzard, amongst other species, are so much more impressive, up-to-date and thorough than anything which Dr. Bannerman quotes, that their omission throws his accounts rather out of balance on this aspect. Again, in connection with distribution and other features, the story is not always quite up-to-date or complete, but on the other hand information is often given which is not available elsewhere. Provided the reader, then, remembers that this work, in spite of its size, coverage and wealth of detail, is not exhaustive, he will find it indispensable and he will certainly wish to encourage Dr. Bannerman to complete his long but pleasure-giving task.

P.A.D.H.

## LETTERS

### "SCIENCE AND THE BIRD-WATCHER"

SIRS,—As a reader of *British Birds* for many years, may I be allowed to offer my humble opinion on the views expressed so forcibly by Messrs. G. L. Scott and D. K. Ballance in the September number (*antea*, pp. 398-399).

Surely the whole matter centres around the question whether there are too many "bird-watchers" as opposed to those who are really amateur ornithologists in the truest sense of that term, and who are always ready to take part in national enquiries and field studies, rather than to spend their time merely watching for as many different species as possible.

Judging from some "bird-watchers" known to me, the sole aim of so many to-day is to see how many different species and rarities they can observe, rather than to occupy their time in studying the habits and behaviour of the creatures they so assiduously hunt. This "collecting" mania is almost as virulent as was the egg and skin collecting of a past age.

*British Birds* strikes a happy medium, and lives up to its reputation established over fifty years, as a journal primarily concerned with birds on the British list in a manner that does justice to its editors.

If "bird-watchers" want their ornithology popularized, there

are plenty of articles in newspapers and other periodicals, but let *British Birds* remain what it is and always has been, journal of unimpeachable scientific value to all ornithologists, both professional and amateur.

CHAS. H. COOKE

SIRS,—As another "bird-watcher", I write to say how completely I agree with Messrs. Scott and Ballance's letter in your September issue.

We now have in this country a very large number of people interested in birds, and the hobby is attracting more and more followers as a result of the publicity given to it by television, radio programmes and otherwise; yet there is no journal which really caters for the 'bird-watcher'.

*British Birds* differs but little from *Bird Study* in its predominantly scientific approach. Why cannot that aspect of bird-watching—ornithology if you like to call it that—be kept the province of *Bird Study*, the journal of what is essentially a scientific body? *British Birds* could then publish material of real interest to the "bird-watcher".

Articles on field-identification and behaviour as opposed, for example, to wing-formulae and parasites (which few of us have the opportunity to study except at observatories) would I am sure prove immensely popular. Then I would suggest that the more interesting articles appearing in the journals of local societies could be published by *British Birds*.

Finally, if it be doubted that the views expressed here are those held generally, let *British Birds* send out a questionnaire with its next issue inviting the views of its readers on the above matters. This course was successfully adopted recently by the journal of the professional society to which I belong.

D. BICKNELL

SIRS,—In company, no doubt, with many other bird-watchers I feel that I must comment on the extraordinary letter from Messrs. Scott and Ballance in your September issue.

It seems to me that there are three main types of bird-watcher:—

- (1) The professional zoologist.
- (2) The amateur watcher who wishes to make valuable use of his observations and so may be said to have a "scientific" approach.
- (3) The bird-watcher as defined by Messrs. Scott and Ballance, whose main delight is watching birds at all times and in all places, without wanting to do any more about it.

Now, neither I nor my ornithological friends have found any attempt at conversion from one type to another. The zoologist and the scientific amateur may, and often do, deplore the wasted opportunities of the plain bird-watcher, but to suggest that such activities are decried surely points only to inferiority complexes on the part of your correspondents. No type of bird-watching is



better than another; no-one wishes to interfere with another's pleasure; birds are there (*inter alia*) to be enjoyed by us all.

The policy of your magazine caters for all tastes. One may perhaps question the value of some of the information so painstakingly gathered and recorded, but this is merely criticism of the intrinsic worth of some papers, not of the policy of publishing them.

No, gentlemen, pray continue to uphold a high standard: if your correspondents find the published matter incomprehensible, is this not a question of their own standards of comprehension rather than that of the standard of the papers concerned? Chatty notes and discursive articles lead to shoddy thinking. There is meat for all bird-watchers, amateur or professional, in your magazine: long may it continue!

MICHAEL RAYNER

SIRS,—I do not agree at all with Messrs. Scott and Ballance. Mr. A. W. Boyd's reply (*antea*, pp. 399-400) seems to hit the nail right on the head. The matter you publish is full of interest and must be of the greatest help to all those who are anxious to get down to the "why and wherefore" of bird life. The paper entitled "The 'invasion' type of bird migration", published in the August issue (*antea*, pp. 314-343), was, I thought, particularly interesting and the only suggestion I would venture to make is that the ecological aspect of ornithology might perhaps receive rather more emphasis in *British Birds*. Anyway, all good wishes to "*B.B.*" and many thanks for much enjoyable reading.

W. N. A. THOMPSON

[The above are typical of the many comments received on this subject. Space permitting, it is hoped to publish a further small selection in our next issue. For what it is worth, those in favour of Mr. Boyd's reply outnumber the supporters of Messrs. Scott and Ballance by about 6 to 1, but we do not wish this fact to be taken as a signal that there should be a further flood of correspondence: we appreciate that criticism of the type brought forward by Messrs. Scott and Ballance is always more likely to stimulate those who disagree than those who feel that their point has already been made. We are always glad to receive constructive comments, however, and we are considering a number of the suggestions that have been made.—EDS.]

## REQUESTS FOR INFORMATION

**Irruptions of tits and other species.**—It is now clear that the movements of tits (*Parus* spp.) and other birds, referred to last month (*antea*, p. 495), are larger and more complex than was at first apparent. Reports have come in of outbreaks of paper-tearing, putty-pecking, attacks on milk-bottles, etc., by tits in many parts of the country and information of this behaviour is now required in addition.

In order to handle the increased mass of data more fully, Mr. S. Cramp is now joining Messrs. A. Pettet and J. T. R. Sharrock in the enquiry. *All*

records should still be sent to Messrs. Pettet and Sharrock at the Botany Department, University of Southampton.

**The status of the Red-crested Pochard in the British Isles.**—In recent years the Red-crested Pochard (*Netta rufina*) has been extending its range westwards in the northern half of Europe. As a result, for example, several pairs now nest annually in Holland (where it was unknown as a breeding species before the 1939-45 war) and moderate to substantial numbers now appear there in the late summer, gradually dispersing in the autumn. During the last few years the species has been of annual occurrence in Essex—chiefly at Abberton reservoir, near Colchester—most records referring to the period from August to December. Up to and including 1955, not more than 5 birds had been recorded there at any one time, but in November 1956 up to 22 were present, and this autumn a maximum of 16 have been recorded at Abberton and 4 at another reservoir in Essex. The fact that the species is becoming increasingly popular as an ornamental waterfowl in Britain obscures the matter considerably, but it does seem possible that some of the Essex birds may, in view of the season involved and the proximity of that county to Holland, be wild immigrants; and the same may apply to some of the other Red-crested Pochards that have been recorded in this country.

Mr. G. A. Pyman is therefore trying to trace all records of possibly wild Red-crested Pochards in the British Isles since 1948, so that they can be analysed as part of an attempt to assess the true status of this species in Britain today. If any of our readers has encountered this bird in an apparently wild state during the period in question, but has not reported the fact to any appropriate county report, we should be very grateful if details could be sent to Mr. Pyman at 99, Galleywood Road, Chelmsford, Essex.

**Waxwings in November 1957.**—In our last issue (*antea*, p. 496) it was suggested that there might be another irruption of Waxwings (*Bombycilla garrulus*) in Britain during the month of November. In fact, a sizeable quantity of Waxwings have now arrived and we have received reports from a number of English and Scottish counties. For the most part, small parties seem to be involved, but among the flocks reported so far have been groups of 23 in Cumberland, about 30 in Banffshire and approximately 50 in Norfolk. Thus, Dr. G. Svårdson's forecast, made as long ago as last February and referred to in his paper in our August issue (*antea*, p. 339), seems to have been amply justified.

As previously announced, Mr. R. K. Cornwallis is collecting records of the invasion in February and March 1957, and he would now like to receive these latest records as well, so that the two related irruptions can be analysed together. We should be very glad if all reports of Waxwings in the British Isles in 1957 could be sent to him at Bleasby Grange, Legsby, Market Rasen, Lincs.

**Phalaropes in the autumn of 1957.**—A considerable influx of Grey Phalaropes (*Phalaropus fulicarius*), and apparently smaller numbers of Red-necked (*Ph. lobatus*), occurred in Britain during the autumn of 1957, many parts of the coast and some inland localities being concerned. It is felt that the numbers of birds were sufficiently large to justify an analysis, with an examination of the weather and other factors involved. We ask, therefore, that all records not sent to a county bird report should be passed either to Mr. Bryan L. Sage, 11, Deepdene, Potters Bar, Middlesex, or to Mr. Bernard King, Mayfield, Uplands Road, Saltford, Bristol, as they have jointly undertaken this work.

**A "wreck" of Little Auks?**—During November 1957 large numbers of Little Auks (*Plautus alle*) were seen off various parts of the east coast of Britain, and we have received several reports of single birds in inland counties. It seems probable that the numbers of Little Auks in British waters have been unusually high, but that the lack of severe gales during most of the period concerned has prevented any real "wreck". It does not seem likely that there are sufficient data to warrant any analysis, but we should welcome further information.

**The increased wintering by Ruffs during 1954-57.**—At the time of the publication of Vol. IV *The Handbook* (1940) Ruffs (*Philomachus pugnax*) were considered to be no more than "occasional" as winter-visitors to the British Isles, but now, for some years past, wintering Ruffs have been observed regularly in several counties, perhaps particularly Devon, Cambridgeshire, Nottingham and Cheshire. Further, in the last four winters the species seems to have become increasingly widespread and we feel therefore that there should be an attempt to assess the extent of this change of status. A number of 1954-55 records were given by Mr. J. A. G. Barnes in his paper on the "Delayed emigration of certain birds in autumn 1954" (*antea*, vol. xlix, pp. 169-170) and some records have appeared in various county bird reports. We believe, however, that there are many occurrences which have not been reported to any county organization and we should be very grateful if all such for the years 1954-57 could be sent to Mr. B. L. Sage, 11, Deepdene, Potters Bar, Middlesex.

### CALENDARS AND CHRISTMAS CARDS

We have received, for review, several Calendars and Christmas Cards. Readers of *British Birds* will be interested to know that the BRITISH TRUST FOR ORNITHOLOGY are this year selling four photographic cards using the plates of Kentish Plover, Kite, Nightingale and Lesser Spotted Woodpecker, by Stuart Smith and Eric Hosking, which appeared on the covers of our March, April, May and June issues. These are obtainable from the B.T.O., 2, King Edward Street, Oxford, price 6d. each or 6s. a dozen, including envelopes (plus postage 5d. a dozen, 2½d. each additional dozen). The B.T.O. also offer Christmas cards with black-and-white drawings of Dipper and Peregrine, by Roger Tory Peterson and Maurice Wilson respectively, at the same prices; in addition, a Fulmar in colour, by Peter Scott, at 9d. each or 9s. a dozen (postage 8d. a dozen, or 5d. a half-dozen). Other cards and calendars include the following:—

R.S.P.B. BIRD CALENDAR 1958 (6s. 6d., including postage, from R.S.P.B., 25, Eccleston Square, London, SW.1.).—This is a beautiful calendar, 7" × 8", in full colour, with a cover photograph of Blackbird, by John Markham, and photographs for every two months, of Long-eared Owl, Great Crested Grebe, Gannet, Chiffchaff, Flamingos and Merlin, by J. T. Fisher, J. Reynolds, J. Markham, Eric Hosking, G. K. Yeates and G. Farrar respectively.

R.S.P.B. CHRISTMAS CARDS (10s. a dozen, including postage, from R.S.P.B., 25, Eccleston Square, London, S.W.1.).—There are four attractive designs by C. F. Tunnicliffe, all in colour, of Partridge, Shelduck, Grey Wagtail and Bullfinch.

COUNTRY LIFE "BIRDS OF BRITAIN" CALENDAR 1958 (6s., from booksellers and newsagents).—An excellently produced calendar, 10" × 8½", with a black-and-white photograph for each fortnight, all by Eric Hosking. Among the species illustrated are several taken in southern Spain on the expeditions referred to in the comparison between the Camargue and the Coto Doñana, that appears on pages 497-519 and plates 69-80; these include Kite, Night Heron, Squacco Heron, Bee-eater, Little Egret and Pratincole.

Finally there is a rather special publication which will be of interest to all naturalists and others wishing to keep brief, but complete, records of their local weather and temperatures. This is a WEATHER RECORD CHART AND CALENDAR combined, that is published (price 10s.) by Messrs. Edward Mortimer, Ltd., 12, Thayer Street, London, W.1. It is designed to hang on the wall, like an ordinary calendar, but its large size (9½" × 14") makes it possible for each of the twelve monthly sheets to include the day of the week and the date, and, opposite each, fourteen columns for recording various barometer readings, wind, temperature, inches of rain, hours of sunshine, and "Remarks". Each page has a table of "Normals" based on the official records at Kew, and the whole calendar is made complete by a very full explanatory introduction and a map showing the names of the sea and land areas used in weather reports and forecasts about the British Isles

PURCHASED

2 DEC 1957



# INDEX

Compiled by MRS. N. D. BLAMIRE

Entries are in a single list with references to:

(i) every significant mention of each species, not only in titles, but within the text of papers and notes, including all those appearing in such lists as the *Reports on bird-ringing for 1955 and 1956*; in such groups as "Warbler", "Thrush", "Duck", etc., there are cross-references to those members of the family which do not bear the family name and so appear elsewhere, e.g. "Blackcap", "Fieldfare", "Wigeon", etc.;

(ii) scientific nomenclature listed under generic names only;

(iii) authors of all papers, notes and letters; and photographers;

(iv) a few subject headings, i.e. "Breeding (nests, eggs, fledging)", "Display", "Distribution", "Field-characters", "Food", "Migration", "Obituaries", "Parasites", "Requests for Information", "Voice";

(v) "Reviews" which are listed together under this heading in alphabetical order of authors reviewed.

- Accipiter badius*, see Sparrowhawk, Levant.  
 — *gentilis*, see Goshawk.  
 — *nisus*, see Sparrowhawk.  
*Acrocephalus arundinaceus*, see Warbler, Great Reed.  
 — *paludicola*, see Warbler, Aquatic.  
 — *palustris*, see Warbler, Marsh.  
 — *schoenobaenus*, see Warbler, Sedge.  
 — *scirpaceus*, see Warbler, Reed.  
*Aegithalos caudatus*, see Tit, Long-tailed.  
*Aegolius funereus*, see Owl, Tengmalm's.  
*Aegyptius monachus*, see Vulture, Black.  
*Agrobates galactotes*, see Warbler, Rufous.  
*Alauda arvensis*, see Skylark.  
*Alca torda*, see Razorbill.  
*Alcedo atthis*, see Kingfisher.  
 Alder, James, Note on Brown Fly-catcher in Northumberland, 125-6; the Dipper's winking, 267-9, pl. 46-47.  
*Alectoris rufa*, see Partridge, Red-legged.  
 Alexander, H. G., Note on brown-and-white Willow Warbler breeding in Ross-shire, 307-8.  
 —, —, see Williamson, Kenneth.  
 Allen, R. H., and Rutter, G., The moult migration of the Shelduck from Cheshire in 1956, 344-6.  
*Anas acuta*, see Pintail.  
 — *angustirostris*, see Duck, Marbled.  
 — *crecca*, see Teal.  
 — *carolinensis*, see Teal, Green-winged.  
 — *discors*, see Teal, Blue-winged.  
*Anas penelope*, see Wigeon.  
 — *platyrhynchos*, see Mallard.  
 — *querquedula*, see Garganey.  
 — *strepera*, see Gadwall.  
 Andrew, D. G., Photograph of Ptarmigan, pl. 20.  
 Angles, R., Note on a feeding method of Black Tern, 538.  
 Anniversary messages, 224-39.  
*Anser albifrons*, see Goose, White-fronted.  
 — *anser*, see Goose, Grey Lag.  
 — *arvensis brachyrhynchus*, see Goose, Pink-footed.  
*Anthus campestris*, see Pipit, Tawny.  
 — *cervinus*, see Pipit, Red-throated.  
 — *pratensis*, see Pipit, Meadow.  
 — *spinoletta petrosus*, see Pipit, Rock.  
 — *trivialis*, see Pipit, Tree.  
 Appleby, R. H., and Hulme, D. C., Note on Avocets in Derbyshire, 32.  
*Apus apus*, see Swift.  
 — *pallidus*, see Swift, Pallid.  
*Aquila chrysaetos*, see Eagle, Golden.  
 — *heliaca*, see Eagle, Imperial.  
*Ardea cinerea*, see Heron.  
 — *purpurea*, see Heron, Purple.  
*Ardeola ibis*, see Egret, Cattle.  
 — *ralloides*, see Heron, Squacco.  
*Arenaria interpres*, see Turnstone.  
 Armstrong, Edward A., Letter on "Dunnock" and "Hedge-sparrow", 36.  
 Arnold, E. L., and Ellis, J. C. S., Note on Crossbills feeding on grain in gull-pellets, 347.  
*Asio flammeus*, see Owl, Short-eared.  
 — *otus*, see Owl, Long-eared.

- Athene noctua*, see Owl, Little.  
 Auger, H., Photograph of Ptarmigan, pl. 18.  
 AUK, LITTLE, nos. ringed, 1956, 456.  
 AUKS, see also Guillemot, Puffin, Razorbill.  
 AVOCET, in Derbyshire, 32; at sewage farms, 258; status in Guadalquivir and Camargue, 514.  
*Aythya ferina*, see Pochard.  
 — *fuligula*, see Duck, Tufted.  
 — *marila*, see Scaup.  
 — *nyroca*, see Duck, Ferruginous.
- Bailey, J. A., Note on Quail swimming, 303.  
 Ballance, D. K., see Scott, G. L.  
 Band, R. M., Note on Lapwing apparently with brood of seven, 352-3.  
 Beard, P. E., Coleman, Bruce, and Jones, Edward, Note on melanistic Ringed Plover in Kent, 347-8.  
 BEE-EATER, eating dragonfly, 76; nest-excavation, 263-67, pl. 43-45; breeding in Alderney, 361-4; status in Guadalquivir and Camargue, 515.  
 Bentham, Howard, Note on Turtle Doves sun-bathing, 75.  
 Beretzk, Peter, Photographs of Mediterranean Black-headed Gull, pl. 9-11.  
 Bille, R. P., Photographs of Ptarmigan, pl. 22-24.  
 Bishop, W. F., Note on Spotted Sandpiper in Norfolk, 490-1.  
 BITTERN, status in Guadalquivir and Camargue, 513.  
 —, LITTLE, in Lancashire, 119; status in Guadalquivir and Camargue, 513.  
 BLACKBIRD, nos. ringed and recovered, 1955, 42, 65; migration at E. coast observatories, 112-14; feeding brood of Dunnocks, 123-4; *Neotiophilum* in nests, 161-2, 164; large nest, 491; anting-behaviour, 414; nos. ringed and recovered, 1956, 455, 477; status in Guadalquivir and Camargue, 515.  
 BLACKCAP, nos. ringed and recovered, 1955, 42, 68; migration at E. coast observatories, 107, 110; *Neotiophilum* in nests, 161; nos. ringed and recovered, 1956, 455; status in Guadalquivir and Camargue, 515.  
 BLUETHROAT, migration at E. coast observatories, 107-8, 110-2; on Skokholm, 205; nos. ringed, 1956, 456.  
*Bombycilla garrulus*, see Waxwing.  
*Botaurus stellaris*, see Bittern.  
 Bottomley, J. B., Note on Snipe with abnormal bill, 75, pl. 16.  
 Boyd, A. W., Sewage-farms as bird-habitats, 253-63; note on return of Great Grey Shrike to winter territory, 271-2; on Oystercatcher and Dunlin nesting near Manchester, 303-4; letter on science and the bird-watcher, 399-400.  
 Boyd, Hugh, Note on early sexual maturity of a female Mallard, 302-3; on Blue-winged Teal in Gloucestershire, 349-50.  
 Boyer, G. F., Note on Atlantic crossing by Starling, 209-10.  
 Bradley, R. J., Note on Black Stork in Worcestershire, 348.  
 BRAMBLING, "invasion" migration, 329; migration in N. Devon, 17-19; nos. ringed and recovered, 1955, 42, 72; migration at E. coast observatories, 111-14; anting-behaviour, 413; nos. ringed and recovered, 1956, 455, 484.  
*Branta bernicla*, see Goose, Brent.  
 — *canadensis*, see Goose, Canada.  
 BREEDING: Storm Petrel, 85-101, 371-84, pl. 49-51; Tufted Duck, 2-10; Nightjar, 273-77; Song Thrush, 77.  
 —: NESTS: Terns, 121-2; Black-throated Diver, 439, pl. 63; Bee-eater, 263-7, pl. 43-45; Blue Tit, 393-5; Blackbird, 491; Robin, 124, 492; Sedge Warbler, 78; Linnet, 397-8.  
 —: EGGS: Swallow, 441.  
 —: FLEDGING: Nuthatch, 526-8.  
 Brown, P. E., The rarer birds of prey: their present status in the British Isles: Hobby, 149.  
 Browne, P. W. P., and Rutledge, Robert F., The status of the Pied Flycatcher and the Tree Pipit in Ireland, 424-32.  
 Brownlow, H. G., Letter on ringing in Egypt, 312.  
*Bubo bubo*, see Owl, Eagle.  
 BULLFINCH, "invasion" migration, 327; nos. ringed and recovered, 1955, 42; nos. ringed and recovered, 1956, 455.  
 —, CONTINENTAL (= NORTH-ERN) at Fair Isle, 113.  
 BUNTING, CIRL, nos. ringed, 1955, 42; nos. ringed, 1956, 455; status in Camargue, 516.  
 —, CORN, nos. ringed and recovered, 1955, 42; nos. ringed and recovered, 1956, 455; status in Guadalquivir and Camargue, 516.

- BUNTING, CRETZSCHMAR'S, field-characters, 204.
- , LAPLAND, nos. ringed, 1955, 43; migration at E. coast observatories, 106, 110-11; nos. ringed, 1956, 457.
- , LITTLE, in Surrey, 206-8; in Middlesex, 208-9; nos. ringed, 1956, 457.
- , ORTOLAN, migration at E. coast observatories, 107, 110-11; in Middlesex, 118-9; photographic study, 197-200, pl. 33-35; on Skokholm, 205; field characters, 206; nos. ringed, 1956, 457; status in Camargue, 516.
- , REED, nos. ringed, 1955, 42, 72; nos. ringed and recovered, 1956, 455, 485; status in Guadalquivir and Camargue, 516.
- , SNOW, nos. ringed and recovered, 1955, 42, 72; migration at E. coast observatories, 112; nos. ringed and recovered, 1956, 455, 485.
- , YELLOW, see Yellowhammer.
- Burhinus oedicephalus*, see Curlew, Stone.
- BUSTARD, GREAT, status in Guadalquivir, 514.
- , LITTLE, status in Guadalquivir and Camargue, 514.
- Buteo buteo*, see Buzzard.
- Buxton, E. J. M., Letter on sight recoveries of marked Oystercatchers, 312; note on impressions left by birds striking glass windows, 303, pl. 56; migrations of the Oystercatcher in the area of Britain: results of ringing, 519-24.
- BUZZARD, nos. ringed and recovered, 1955, 40, 53; status in Britain, 173-97; flight at high altitudes, 292; nos. ringed and recovered, 1956, 453, 466; status in Guadalquivir, 514.
- , HONEY, status in Britain, 141-2.
- Calandrella brachydactyla*, see Lark, Short-toed.
- *rufescens*, see Lark, Lesser Short-toed.
- Calcarius lapponicus*, see Bunting, Lapland.
- Calidris alpina*, see Dunlin.
- *bairdii*, see Sandpiper, Baird's.
- *canutus*, see Knot.
- *fuscicollis*, see Sandpiper, White-rumped.
- *maritima*, see Sandpiper, Purple.
- *melanotos*, see Sandpiper, Pectoral.
- *minuta*, see Stint, Little.
- *pusilla*, see Sandpiper, Semi-palmated.
- Calidris temminckii*, see Stint, Temminck's.
- *testacea*, see Sandpiper, Curlew.
- Campbell, James W., The rarer birds of prey: their present status in the British Isles: Hen Harrier, 143-6.
- Capella gallinago*, see Snipe.
- *media*, see Snipe, Great.
- Caprimulgus europaeus*, see Nightjar.
- *ruficollis*, see Nightjar, Red-necked.
- Carduelis cannabina*, see Linnet.
- *carduelis*, see Goldfinch.
- *flammea*, see Redpoll.
- — *cabaret*, see Redpoll, Lesser.
- — *flammea*, see Redpoll, Mealy.
- — *rostrata*, see Redpoll, Greenland.
- *flavirostris*, see Twite.
- *spinus*, see Siskin.
- Carpodacus erythrinus*, see Grosbeak, Scarlet.
- CATBIRD, anting-behaviour, 415.
- Certhia brachydactyla*, see Treecreeper, Short-toed.
- *familiaris*, see Treecreeper.
- Cettia cetti*, see Warbler, Cetti's.
- CHAFFINCH, migration in N. Devon, 10-19; nos. ringed and recovered, 1955, 42, 72; migration at E. coast observatories, 112-3; *Neotiophilum* in nests, 161-2; anting-behaviour, 413; nos. ringed and recovered, 1956, 455, 484; status in Guadalquivir and Camargue, 516.
- Charadrius alexandrinus*, see Plover, Kentish.
- *apricaria*, see Plover, Golden.
- *dubius*, see Plover, Little Ringed.
- *hiaticula*, see Plover, Ringed.
- *morinellus*, see Dotterel.
- *squatarola*, see Plover, Grey.
- Charteris, Guy, Letter on the birds of Gloucestershire, 127.
- CHIFFCHAFF, nos. ringed and recovered, 1955, 42, 69; abnormal song, 124-5; field-characters, 204; nos. ringed and recovered, 1956, 455, 481.
- Chlidonias hybrida*, see Tern, Whiskered.
- *niger*, see Tern, Black.
- Chloris chloris*, see Greenfinch.
- CHOUGH, nos. ringed and recovered, 1955, 41, 63; nos. ringed and recovered, 1956, 454.
- Church, A. C., see Richardson, R. A.
- Ciconia ciconia*, see Stork, White.
- *nigra*, see Stork, Black.
- Cinclus cinclus*, see Dipper.
- Circus gallicus*, see Eagle, Short-toed.
- Circus aeruginosus*, see Harrier, Marsh.



- Circus cyaneus*, see Harrier, Hen.  
 — *pygargus*, see Harrier, Montagu's.  
*Cissa chinensis*, see Magpie, Green.  
*Cisticola juncidis*, see Warbler, Fan-tailed.  
*Clangula hyemalis*, see Duck, Long-tailed.  
*Coccothraustes coccothraustes*, see Hawfinch.  
 Cohen, Edwin, Note on regular drumming of Great Spotted Woodpecker in September, 122.  
 Coleman, Bruce, see Beard, P. E.  
*Columba livia*, see Dove, Rock.  
 — *oenas*, see Dove, Stock.  
 — *palumbus*, see Woodpigeon.  
 Congress, 12th International Ornithological, preliminary announcement, 400.  
 Coombs, C. J. F., Letter on birds' methods of estimating flight-speed, 35-6.  
 COOT, nos. ringed and recovered, 1955, 40, 54; nos. ringed and recovered, 1956, 453, 467; status in Guadalquivir and Camargue, 514.  
 —, CRESTED, status in Guadalquivir, 514.  
*Copsychus saularis* see Magpie-Robin.  
*Coracias garrulus*, see Roller.  
 CORMORANT, nos. ringed and recovered, 1955, 40, 46; explanation of "wing-drying", 447-8; nos. ringed and recovered, 1956, 453, 460.  
 CORNCRAKE, nos. ringed, 1955, 40; nos. ringed, 1956, 453.  
 Cornwallis, R. K., The pattern of migration in 1955 at the E. coast bird observatories, 105-118.  
*Corvus corax*, see Raven.  
 — *cornix*, see Crow, Hooded.  
 — *corone*, see Crow, Carrion.  
 — *frugilegus*, see Rook.  
 — *monedula*, see Jackdaw.  
*Coturnix coturnix*, see Quail.  
 Coward, T. G., Note on Pratincole in Devon, 120.  
 CRAKE, BAILLON'S, status in Guadalquivir and Camargue, 514.  
 —, LITTLE, status in Guadalquivir and Camargue, 514.  
 —, SPOTTED, status in Guadalquivir and Camargue, 514.  
 CRACKS, see also Corncrake.  
 CRANE, distraction display, 166-8.  
 Craster, W. S., Note on Song Thrush breeding in October, 77.  
*Crex crex*, see Corncrake.  
*Crocethia alba*, see Sanderling.  
 CROSSBILL, nos. ringed, 1955, 42; feeding on elm leaves, 79; feeding on grain in gull-pellets, 347; "invasion" migration, 322-3, 327-30, 336; nos. ringed, 1956, 455.  
 CROSSBILL, TWO-BARRED, "invasion" migration, 326.  
 CROW, CARRION, nos. ringed and recovered, 1955, 41; *Neottiophilum* in nests, 161; flight at high altitudes, 296; anting-behaviour, 409-10; nos. ringed and recovered, 1956, 454, 476; status in Guadalquivir and Camargue, 515.  
 —, HOODED, nos. ringed, 1955, 41; migration at E. coast observatories, 113-4; anting-behaviour, 410; nos. ringed, 1956, 454.  
 CROWS, see also Chough, Jackdaw, Jay, Magpie, Nutcracker, Raven, Rook.  
 CUCKOO, nos. ringed and recovered, 1955, 41, 62; nos. ringed and recovered, 1956, 454, 475; status in Guadalquivir and Camargue, 515; display, 538.  
 —, GREAT SPOTTED, status in Guadalquivir and Camargue, 515.  
*Cuculus canorus*, see Cuckoo.  
 CURLEW, nos. ringed and recovered, 1955, 40, 56; migration at E. coast observatories, 107; at Nottingham sewage farm, 260; nos. ringed and recovered, 1956, 453, 469.  
 —, STONE, nos. ringed, 1955, 41; in Shetland, 107; status in Guadalquivir and Camargue, 514.  
 Currier, Noel, and Howorth, Michael, Note on Swallows apparently feeding on torpid flies, 76.  
 —, —, —, —, and Hazelwood, Alfred, Note on an unusual tit's nest, probably of Blue Tit, 393-5.  
 Curry-Lindahl, Kai, Photographic studies of some less familiar birds: LXXXIV. Eagle Owl, 486-90.  
*Cyanocitta cristata*, see Jay, Blue.  
*Cyanopica cyanus*, see Magpie, Azure-winged.  
*Cyanosylvia svecica*, see Bluethroat.  
*Cygnus cygnus*, see Swan, Whooper.  
 — *olor*, see Swan, Mute.  
*Dacnis cayana*, see Sugarbird, Blue.  
 Davis, Peter, The breeding of the Storm Petrel, 85-101, 371-84, pl. 49-51; comments on the B.B.C. recordings of Storm Petrels, 384; note on vagrants at Skokholm in September 1956, 205-6.  
 Davis, T. A. W., Note on alarm-note of Whimbrel, 31.  
*Delichon urbica*, see Martin, House.

- Dendrocopos major*, see Woodpecker, Great Spotted.
- *minor*, see Woodpecker, Lesser Spotted.
- Dennis, R. H., see Richards, E. G.
- DIPPER, nos. ringed and recovered, 1955, 42; blinking action, 267-9, pl. 46-47; anting-behaviour, 414; nos. ringed and recovered, 1956, 455.
- DISPLAY: Smew, 31; Crane, 166-8; Cuckoo, 538.
- DISTRIBUTION: New British bird: Collared Dove, 239-46.
- DIVER, BLACK-THROATED, unusual nest, 439, pl. 63.
- , GREAT NORTHERN, nos. ringed, 1955, 43.
- , RED-THROATED, nos. ringed and recovered, 1955, 43.
- Doncaster, C. C., Photographs of Red-necked Grebe, pl. 6-7.
- DOTTEREL, nos. ringed, 1956, 456.
- DOVE, COLLARED, in Norfolk, 239-46, pl. I, 41-42; in Surrey, 270-1; nos. ringed, 1956, 456.
- , ROCK, nos. ringed, 1956, 456.
- , STOCK, nos. ringed and recovered, 1955, 41, 43; nos. ringed and recovered, 1956, 454.
- , TURTLE, nos. ringed, 1955, 41; sun-bathing, 75; on Fair Isle, 110; nos. ringed and recovered, 1956, 454, 474; status in Guadalquivir and Camargue, 515.
- DOVES, see also Woodpigeon.
- DOWITCHER, in Co. Wexford, 304.
- Driver, Ronald, Note on Linnets nesting socially in tufts of the Common Rush, 397-8.
- Dryocobus martius*, see Woodpecker, Black.
- DUCK, FERRUGINOUS, status in Guadalquivir, 514.
- , HARLEQUIN, field-characters of juvenile, 445-7, pl. 64.
- , LONG-TAILED, field-characters of juvenile, 445-7, pl. 64.
- , MARBLED, status in Guadalquivir and Camargue, 513.
- , SHELD, see Shelduck.
- , TUFTED, breeding population in St. James's Park, 2-10; nos. ringed and recovered, 1955, 40, 51; white feathering, 389-93; nos. ringed and recovered, 1956, 453, 465.
- , WHITE-HEADED, status in Guadalquivir, 514.
- DUCKS, see also Eider, Gadwall, Garganey, Goosander, Mallard, Merganser, Pintail, Pochard, Scaup, Scoter, Shelduck, Shoveler, Smew, Teal, Wigeon.
- Dumetella carolinensis*, see Catbird.
- DUNLIN, nos. ringed and recovered, 1955, 41, 57; migration at E. coast observatories, 107; at sewage farms, 256, 261; breeding near Manchester, 303; nos. ringed and recovered, 1956, 453, 470; in N. Atlantic, 533.
- DUNNOCK, name, 36; nos. ringed and recovered, 1955, 42, 69; migration at E. coast observatories, 106-7; *Neotiophilum* in nests, 161-2; brood fed by Blackbird, 123-4; nos. ringed and recovered, 1956, 455.
- EAGLE, BONELLI'S, status in Camargue, 514.
- , BOOTED, status in Guadalquivir, 514.
- , GOLDEN, status in Britain, 131-5; nos. ringed, 1956, 456; status in Guadalquivir, 514.
- , IMPERIAL, status in Guadalquivir, 514.
- , SHORT-TOED, status in Guadalquivir and Camargue, 514.
- Editorials, increase in subscription rates, 1; the first fifty years, 213-223; 313-4.
- EGRET, CATTLE, status in Guadalquivir, 513, pl. 73, 74, 78.
- , LITTLE, status in Guadalquivir and Camargue, 513, pl. 73, 74.
- Egretta garzetta*, see Egret, Little.
- EIDER, nos. ringed and recovered, 1955, 40, 52; nos. ringed and recovered, 1956, 453; status in Camargue, 514.
- Ellis, J. C. S., see Arnold, E. L.
- Ellström, Kurt, and Sjöberg, Enar, Photographs of Eagle Owl, pl. 65-68.
- Emberiza caesia*, see Bunting, Cretzschmar's.
- *calandra*, see Bunting, Corn.
- *cirlus*, see Bunting, Cirl.
- *citrinella*, see Yellowhammer.
- *hortulana*, see Bunting, Ortolan.
- *pusilla*, see Bunting, Little.
- England, M. D., Photographs of Red-necked Grebe, pl. 2-5; note on a second unusual nest of Black-throated Diver, 439, pl. 63.
- English, R. D., Note on Blackbirds building unusually large nests, 491.
- Ennion, H., Rutledge, Robert F., and Underwood, T. J., Note on Dowitcher in Co. Wexford, 304; on Upland Sandpiper in Co. Wexford, 304-5.
- Erithacus rubecula*, see Robin.
- Eremophila alpestris*, see Lark, Shore.

- Falco cherrug*, see Falcon, Saker.  
 — *columbarius*, see Merlin.  
 — *naumanni*, see Kestrel, Lesser.  
 — *peregrinus*, see Peregrine.  
 — *subbuteo*, see Hobby.  
 — *tinnunculus*, see Kestrel.  
 — *vespertinus*, see Falcon, Red-footed.  
 FALCON, PEREGRINE, see Peregrine.  
 —, RED-FOOTED, nos. ringed, 43; at Fair Isle, 107.  
 —, SAKER, field-characters, 202.  
 FALCONS, see also Hobby, Kestrel, Merlin.  
 Ferguson-Lees, I. J., Photographic studies of some less familiar birds: LXXVII. Red-necked and Black-necked Grebes, 23-25; LXXX. Kite, 155-60; LXXXI. Ortolan Bunting—Addendum, 200; LXXXII. Great Grey Shrike, 250-3; LXXXIII. Sooty Tern, 385-9; the rarer birds of prey: their present status in the British Isles: Peregrine, 149-55.  
 —, —, see Nicholson, E. M.  
 FIELD-CHARACTERS: Levantine (Manx) Shearwater, 201; Cory's Shearwater, 201; Tufted Duck, 389-93; Long-tailed Duck, 445-7, pl. 64; Harlequin Duck, 445-7, pl. 64; Saker Falcon, 202; Levant Sparrowhawk, 201; Lesser Kestrel, 202; Baird's Sandpiper, 350; Semi-palmated Sandpiper, 350; Mediterranean Black-headed Gull, 202; Whiskered Tern, 202; Sombre Tit, 203; Rock Nuthatch, 203; Iceland Redwing, 84; Black-eared Wheatear, 203; Thrush Nightingale, 203; Melodious Warbler, 205-6; Olivaceous Warbler, 203; Subalpine Warbler, 204; Collared Flycatcher, 204; Red-breasted Flycatcher, 204; Tawny Pipit, 204; Cretzschmar's Bunting, 204; Ortolan Bunting, 206.  
 FIELDFARE, "invasion" migration, 323-7, 329, 339; migration in N. Devon, 18; nos. ringed and recovered, 1955, 42, 64; migration at E. coast observatories, 111, 113-4; in Kent in June, 347; nos. ringed and recovered, 1956, 455, 476.  
 Fiftieth anniversary messages, 224-39.  
 FINCHES, see also Bullfinch, Chaffinch, Goldfinch, Greenfinch, Hawfinch.  
 FIRECREST, nos. ringed, 1956, 456.  
 Fitter, R. S. R., Letter on information wanted on Black Woodpeckers, 84; note on abnormal song of Chiffchaff, 124-5.  
 FLAMINGO, status in Guadalquivir and Camargue, 513, pl. 79.  
 Flegg, James J. M., Note on Fieldfare in Kent in June, 347.  
 Flint, J. H., and Walker, I. M., Note on a feeding method of Black-headed Gull, 306.  
 Flower, Winifred U., Note on Crossbills feeding on elm leaves, 79.  
 FLYCATCHER, BROWN, in Northumberland, 125-6.  
 —, COLLARED, field-characters, 204.  
 —, PIED, nos. ringed and recovered, 1955, 42, 69; migration at E. coast observatories, 106-10; status in Ireland, 424-32; nos. ringed and recovered, 1956, 455, 481.  
 —, RED-BREASTED, migration at E. coast observatories, 110-12; field-characters, 204; nos. ringed 1956, 456.  
 —, SPOTTED, nos. ringed and recovered, 1955, 42, 69; migration at E. coast observatories, 107-8; nos. ringed and recovered, 1956, 455, 481; status in Guadalquivir and Camargue, 516.  
 Flynn, J. E., Note on Gannets robbing gulls, 537.  
 FOOD: as subject for amateur research, 278-91; Black-headed Gull, 75, 347; Bee-eater, 76; Swallow, 76, 306-7; Crossbill, 79; Grey Wagtail, 76; Starling, 76.  
 Forster, G. H., Letter on atmospheric turbulence and bird flight, 34-5; note on Collared Dove in Surrey, 270-1.  
*Fratercula arctica*, see Puffin.  
*Fringilla coelebs*, see Chaffinch.  
 — *montifringilla*, see Brambling.  
 Fry, C. H., Note on Shags drying wings on water, 33.  
*Fulica atra*, see Coot.  
 — *cristata*, see Coot, Crested.  
 FULMAR, nos. ringed and recovered, 1955, 40, 46; nos. ringed and recovered, 1956, 453, 460; in N. Atlantic, 520-31.  
*Fulmarus glacialis*, see Fulmar.  
 GADWALL, nos. ringed and recovered, 1955, 43, 50; nos. ringed and recovered, 1956, 456, 463; status in Guadalquivir and Camargue, 514.  
*Galerida cristata*, see Lark, Crested.  
 — *theklae*, see Lark, Thekla.  
*Gallinula chloropus*, see Moorhen.  
 GALLINULE, PURPLE, status in Guadalquivir and Camargue, 514.



- GANNET, nos. ringed and recovered, 1955, 40, 46; nos. ringed and recovered, 1956, 453, 460; in N. Atlantic, 531; robbing gulls, 537.
- GARGANEY, nos. ringed and recovered, 1955, 43, 50; nos. ringed and recovered, 1956, 456; status in Guadalquivir and Camargue, 513.
- Garrulus lanceolatus*, see Jay, Lanceolated.
- Gavia arctica*, see Diver, Black-throated.
- *immer*, see Diver, Great Northern.
- *stellata*, see Diver, Red-throated.
- Gelochelidon nilotica*, see Tern, Gull-billed.
- Gibb, John, and Hartley, P. H. T., Bird foods and feeding-habits as subjects for amateur research, 278-91.
- Gillham, E. H., Field-notes on white feathering at the base of the bill and white under tail-coverts in the Tufted Duck, 389-93; notes on Tufted Duck in St. James's Park, London, 2-10.
- Gladwin, T. W., see Sage, Bryan L.
- Glareola pratincola*, see Pratincole.
- GODWIT, BAR-TAILED, at sewage farms, 257; nos. ringed, 1956, 456.
- , BLACK-TAILED, at sewage farms, 257; Icelandic race wintering in Britain, 524-6.
- Göttschi, F., Photographs of Great Grey Shrike, pl. 38-9.
- GOLDCREST, nos. ringed, 1955, 42; migration at E. coast observatories, 112-3; nos. ringed and recovered, 1956, 455, 481.
- GOLDFINCH, migration in N. Devon, 17; nos. ringed and recovered, 1955, 42, 71; nos. ringed and recovered, 1956, 455, 484; status in Guadalquivir and Camargue, 516.
- GOOSANDER, nos. ringed, 1956, 456.
- GOOSE, BRENT, nos. ringed and recovered, 1956, 456.
- , CANADA, nos. ringed and recovered, 1955, 40; nos. ringed and recovered, 1956, 453.
- , GREY LAG, nos. ringed and recovered, 1955, 40, 52; nos. ringed and recovered, 1956, 453, 465.
- , PINK-FOOTED, nos. ringed and recovered, 1955, 40, 53; nos. ringed and recovered, 1956, 453, 466.
- , WHITE-FRONTED, nos. ringed and recovered, 1955, 40, 52; longevity, 164; nos. ringed and recovered, 1956, 453, 465.
- Gorton, Eric, Note on Black-headed Gull feeding on hawthorn berries, 347.
- GOSHAWK, status in Britain, 135-6; unusual specimens in Cambridge-shire and Norfolk, 164-6.
- GRACKLE, PURPLE, anting-behaviour, 407-8, 412.
- Gray, Fred G., Note on Desert Wheatear in Co. Durham, 77.
- GREBE, BLACK-NECKED, photographic study, 23-25, pl. 7; status in Guadalquivir, 513.
- , GREAT CRESTED, penguindance, 269-70, pl. 48; nos. ringed, 1956, 456; status in Guadalquivir and Camargue, 513.
- , LITTLE, feeding association with Coot, 351; nos. ringed and recovered, 43, 453, 459; status in Guadalquivir and Camargue, 513.
- , RED-NECKED, photographic study, 23-25, pl. 1-7.
- GREENFINCH, migration in N. Devon, 17; nos. ringed and recovered, 1955, 42, 71; *Neottio-phylum* in nests, 161-2; at sewage farms, 258; nos. ringed and recovered, 1956, 455, 484; status in Camargue, 516.
- GREENSHANK, nos. ringed, 1956, 456; at Nottingham sewage farm, 262.
- GROSBEAK, EVENING, anting-behaviour, 416.
- , SCARLET, nos. ringed, 43; migration at E. coast observatories, 107, 111.
- GROUSE, BLACK, population peaks and food supply in Scandinavia, 337.
- , RED, nos. ringed, 1956, 40, 453.
- , WILLOW, population peaks and food supply in Scandinavia, 337.
- Grus grus*, see Crane.
- GUILLEMOT, nos. ringed and recovered, 1955, 41, 61; nos. ringed and recovered, 1956, 454, 474.
- , BLACK, nos. ringed, 1955, 41; nos. ringed, 1956, 454.
- GULL, BLACK-HEADED, nos. ringed and recovered, 1955, 41, 59; feeding on berries, 75, 347; flight at high altitudes, 294, 301; feeding method, 306; nos. ringed and recovered, 1956, 454, 471; status in Guadalquivir and Camargue, 514.
- , COMMON, nos. ringed and recovered, 1955, 41, 59; nos. ringed and recovered, 1956, 454, 471.
- , GLAUCOUS, unusual cause of death, 305-6.
- , GREAT BLACK-BACKED, nos. ringed and recovered, 1955, 41, 57; flight at high altitudes, 292; nos. ringed and recovered, 1956, 454, 470.
- , HERRING, nos. ringed and

- recovered, 1955, 41, 58; flight at high altitudes, 292-4, 300; chick swallowing meat skewer, 352; nos. ringed and recovered, 1956, 454, 471; status in Guadalquivir and Camargue, 514; in N. Atlantic, 532.
- GULL, LESSER BLACK-BACKED, nos. ringed and recovered, 1955, 41, 58; breeding at sewage farms, 258; flight at high altitudes, 292; nos. ringed and recovered, 1956, 454, 470; in N. Atlantic, 531.
- , LITTLE, at sewage farms, 258.
- , MEDITERRANEAN BLACK-HEADED, photographic study, 73-5, pl. 9-11; field-characters, 202; nos. in Sussex, 440.
- , SLENDER-BILLED, status in Guadalquivir and Camargue, 514.
- GULLS, see also Kittiwake.
- Gyps fulvus*, see Vulture, Griffon.
- Haematopus ostralegus*, see Oyster-catcher.
- Hagen, Yngvar, Note on the Hen Harrier as a breeding bird in Norway, 166.
- HARRIER, HEN, nos. ringed and recovered, 1955, 40, 53; status in Britain, 143-6; breeding status in Norway, 166; nos. ringed and recovered, 1956, 453, 466.
- , MARSH, nos. ringed and recovered, 1955, 43, 53; status in Britain, 142-3; nos. ringed and recovered, 1956, 456; status in Guadalquivir and Camargue, 514.
- , MONTAGU'S, nos. ringed and recovered, 1955, 40, 53; status in Britain, 146-7; pellet containing whole egg, 352; nos. ringed and recovered, 1956, 453, 466; status in Guadalquivir and Camargue, 514.
- Harris, G. J., Note on Little Buntings in Surrey, 206-8.
- Harrison, R., Note on Black-headed Gulls feeding on hawthorn berries, 75.
- Harrop, J. M., Note on meat skewer swallowed by Herring Gull chick, 352.
- Hartley, P. H. T., see Gibb, John.
- Harwood, N. see McCullagh, D. J.
- HAWFINCH, nos. ringed, 1955, 42; anting-behaviour, 413; nos. ringed, 1956, 455.
- Hazelwood, Alfred, see Currier, Noel.
- HEDGESPARROW, see Dunnock.
- HERON, nos. ringed and recovered, 1955, 40, 47; nos. ringed and recovered, 1956, 453, 461; status in Guadalquivir and Camargue, 513.
- HERON, NIGHT, status in Guadalquivir and Camargue, 513, pl. 73, 76.
- , PURPLE, status in Guadalquivir and Camargue, 513.
- , SQUACCO, status in Guadalquivir and Camargue, 513, pl. 75.
- Hesperiphona vespertina*, see Grosbeak, Evening.
- Hewson, Raymond, Social flying of Ravens, 432-4.
- Hickling, R. A. O., Note on group-display of Smews, 31.
- Hieraetus fasciatus*, see Eagle, Bonelli's.
- *pennatus*, see Eagle, Booted.
- Himantopus himantopus*, see Stilt, Black-winged.
- Hippolais icterina*, see Warbler, Icterine.
- *pallida*, see Warbler, Olivaceous.
- *polyglotta*, see Warbler, Melodious.
- Hirundo rustica*, see Swallow.
- Histrionicus histrionicus*, see Duck, Harlequin.
- Hobbs, John N., Note on feeding association between Coot and Little Grebe, 351-2.
- HOBBY, status in Britain, 149; status in Guadalquivir and Camargue, 514.
- Hollom, P. A. D., Photographic studies of some less familiar birds: LXXVIII. Mediterranean Black-headed Gull, 73-5; the rarer birds of prey: their present status in the British Isles: Goshawk, 135-6; Honey Buzzard, 141-2.
- , —, see Nicholson, E. M.
- HOOPOE, migration at E. coast observatories, 108, 110; nos. ringed, 1956, 456; status in Guadalquivir and Camargue, 515.
- Hosking, Eric, Photographs of Kite, pl. 25-32; of Great Grey Shrike, pl. 37, 39, 40.
- Howorth, Michael, see Currier, Noel.
- Hudson, F. L., Note on Robin's nest of unusual construction, 124.
- Hulme, D. C., Song-posts of the Blackbird in a built-up area, 25-30.
- , —, see Appleby, R. H.
- Huxley, Sir Julian, Review of Studies on Great Crested Grebes, by K. E. L. Simmons, 81-3.
- Hydrobates pelagicus*, see Petrel, Storm.
- Hydroprogne caspia*, see Tern, Caspian.
- Hylocichla guttata*, see Thrush, Hermit.
- *mustelina*, see Thrush, Wood.
- IBIS, GLOSSY, status in Guadalquivir and Camargue, 513.

- Ixobrychus minutus*, see Bittern, Little.
- JACKDAW, methods of estimating flight-speed, 35; nos. ringed and recovered, 1955, 41; nos. ringed and recovered, 1956, 454, 476; status in Guadalquivir and Camargue, 515.
- James, C. M. and Veysey, C. M., Note on Mediterranean Black-headed Gulls in Sussex, 440.
- JAY, nos. ringed and recovered, 1955, 41, 63; anting-behaviour, 408-9, 412-3, 415, pl. 62; nos. ringed and recovered, 1956, 454, 476; status in Camargue, 515.
- , BLUE, anting-behaviour, pl. 58-9.
- , LANCEOLATED, anting-behaviour, 416.
- Jones, Edward, see Beard, P. E.
- Jones, H. I., Some observations on birds in the North Atlantic, 528-34.
- Jones, M., see McCullagh, D. J.
- Junco hyemalis*, see Junco, Slate-coloured.
- JUNCO, SLATE-COLOURED, anting-behaviour, 415.
- Jynx torquilla*, see Wryneck.
- KESTREL, nos. ringed and recovered, 1955, 40, 54; robbed of prey by Magpie, 353; nos. ringed and recovered, 1956, 453, 467; status in Guadalquivir and Camargue, 514.
- , LESSER, field-characters, 202; status in Guadalquivir and Camargue, 514.
- King, Bernard, Note on feeding association between Bewick's Swan and Mallard, 439.
- , —, and Rooke, K. B., Note on Montagu's Harrier's pellet containing whole egg, 352.
- King, J. M. B., Note on unusual call-note of Green Sandpiper, 168.
- KINGFISHER, nos. ringed, 1955, 41; nos. ringed, 1956, 454; status in Camargue, 515.
- KITE, status in Britain, 137-41; photographic study, 155-60, pl. 25-32; flight at high altitudes, 292; status in Guadalquivir, 514.
- , BLACK, status in Guadalquivir and Camargue, 514.
- Kittacincla malabarica*, see Shama.
- KITTIWAKE, nos. ringed and recovered, 1955, 41, 60; nos. ringed and recovered, 1956, 454, 472; in N. Atlantic, 532.
- KNOT, nos. ringed and recovered, 1955, 43, 57; at sewage farms, 256; nos. ringed and recovered, 1956, 456; in N. Atlantic, 533.
- Koffán, K., Photographs of Ortolan Bunting, pl. 33-35.
- Lack, David, The Chaffinch migration in North Devon, 10-19; notes on nesting Nightjars, 273-77.
- Lagopus lagopus*, see Grouse, Willow.
- *mutus*, see Ptarmigan.
- *scoticus*, see Grouse, Red.
- Lambourne, G. C., Note on Whiskered Tern in Radnorshire, 121.
- Lanius collurio*, see Shrike, Red-backed.
- *excubitor*, see Shrike, Great Grey.
- — *pallidirostris*, see Shrike, Steppe.
- *minor*, see Shrike, Lesser Grey.
- *senator*, see Shrike, Woodchat.
- LAPWING, migration in N. Devon, 18; nos. ringed and recovered, 1955, 40, 55; migration at E. coast observatories, 111-13; at Nottingham sewage farm, 260; flight at high altitudes, 292, 301; apparent brood of seven, 352-3; nos. ringed and recovered, 1956, 453, 467; status in Guadalquivir and Camargue, 514.
- LARK, CALANDRA, status in Guadalquivir and Camargue, 515.
- , CRESTED, status in Guadalquivir and Camargue, 515.
- , LESSER SHORT-TOED, status in Guadalquivir, 515.
- , SHORE, nos. ringed, 1955, 43; migration at E. coast observatories, 110, 113.
- , SHORT-TOED, migration at E. coast observatories, 106, 112; status in Guadalquivir and Camargue, 515.
- , THEKLA, status in Guadalquivir, 515.
- LARKS, see also Skylark, Woodlark.
- Larus argentatus*, see Gull, Herring.
- *canus*, see Gull, Common.
- *fuscus*, see Gull, Lesser Black-backed.
- *genei*, see Gull, Slender-billed.
- *hyperboreus*, see Gull, Glaucous.
- *marinus*, see Gull, Great Black-backed.
- *melanocephalus*, see Gull, Mediterranean Black-headed.
- *minutus*, see Gull, Little.
- *ridibundus*, see Gull, Black-headed.
- Leavesley, A., Note on unusual nest-site of Sedge Warbler, 78.
- Lees, John, see Shaw-McKenzie, John.
- Le Sueur, Frances, Bee-eaters breeding in the Channel Islands in 1956, 361-4.



- Limicola jalcinellus*, see Sandpiper, Broad-billed.
- Limnodromus griseus*, see Dowitcher.
- Limosa lapponica*, see Godwit, Bar-tailed.
- *limosa*, see Godwit, Black-tailed.
- LINNET, nos. ringed and recovered, 1955, 42, 71; *Neotriphilum* in nests, 161-2; nesting in rushes, 397-8; nos. ringed and recovered, 1956, 455, 484; status in Camargue, 516.
- Locustella certhiola*, see Warbler, Pallas's Grasshopper.
- *fluviatilis*, see Warbler, River.
- *luscinioides*, see Warbler, Savi's.
- *naevia*, see Warbler, Grasshopper.
- Lord, J., Note on Moorhen feeding by "up-ending", 168.
- Lovell, Ruth E., Note on Blackbird feeding brood of Dunnocks, 123-4.
- Loxia curvirostra*, see Crossbill.
- *leucoptera*, see Crossbill, Two-barred.
- Lullula arborea*, see Woodlark.
- Luscinia luscinia*, see Nightingale, Thrush.
- *megarhynchos*, see Nightingale.
- Luscinola melanopogon*, see Warbler, Moustached.
- Luton, W. G., Note on display and posturing of the Cuckoo, 538.
- Lymnocyptes minimus*, see Snipe, Jack.
- Lyrurus tetrix*, see Grouse, Black.
- McCullagh, D. J., Harwood, N., and Jones, M., Note on Little Bittern in Lancashire, 119.
- McVail, M. J., Note on Melodious Warbler in Devon, 124.
- MAGPIE, nos. ringed and recovered, 1955, 41; robbing Kestrel of prey, 353; anting-behaviour, 413, 415-6; nos. ringed and recovered, 1956, 454; status in Guadalquivir and Camargue, 515.
- , AZURE-WINGED, anting-behaviour, 408; status in Guadalquivir, 515.
- , GREEN, anting-behaviour, 409.
- , RED-BILLED BLUE, anting-behaviour, 409.
- MAGPIE-ROBIN, anting-behaviour, 414.
- Makatsch, Ilse, Photographs of Red-necked Grebe and Black-necked Grebe, pl. 1, 8.
- MALLARD, nos. ringed and recovered, 1955, 40, 47-8; flight at high altitudes, 292; early sexual maturity of female, 302-3; feeding association with Bewick's Swan, 439; nos. ringed and recovered, 1959, 453, 461; status in Guadalquivir and Camargue, 513.
- MARTIN, HOUSE, nos. ringed and recovered, 1955, 41; migration at E. coast observatories, 110; flight at high altitudes, 296; nos. ringed and recovered, 1956, 454; status in Camargue, 515.
- , SAND, nos. ringed and recovered, 1955, 41, 63; migration at E. coast observatories, 110; nos. ringed and recovered, 1956, 454, 476.
- Matheson, Colin, Further Partridge records from Wales, 534-6.
- Melanitta nigra*, see Scoter, Common.
- Melanocorypha calandra*, see Lark, Calandra.
- MERGANSER, RED-BREASTED, nos. ringed and recovered, 1956, 456.
- Mergus albellus*, see Smew.
- *merganser*, see Goosander.
- *scrator*, see Merganser, Red-breasted.
- MERLIN, nos. ringed and recovered, 1955, 40; nos. ringed and recovered, 1956, 453, 466.
- Merops apiaster*, see Bee-eater.
- MIGRATION: Shelduck, 344-6; Oystercatcher, 519-24; Skylark, 17-18; Starling, 17-18; Chaffinch, 10-19.
- , see also Spencer, Robert.
- Milne, B. S., Note on Yellow Wagtail wintering in Surrey, 353.
- Milvus migrans*, see Kite, Black.
- *milvus*, see Kite.
- Mitchell, K. D. G., Further aircraft observations of birds in flight, 291-302.
- Moore, N. W., The past and present status of the Buzzard in the British Isles, 173-197.
- MOORHEN, nos. ringed and recovered, 1955, 40; feeding methods, 168; nos. ringed and recovered, 1956, 453, 467; status in Guadalquivir and Camargue, 514.
- Motacilla alba yarrellii*, see Wagtail, Pied.
- — *alba*, see Wagtail, White.
- *cinerea*, see Wagtail, Grey.
- *flava*, see Wagtail, Yellow.
- — *cinereocapilla*, see Wagtail, Ashy-headed.
- — *flava*, see Wagtail, Blue-headed.
- Mountfort, Guy, Assistance wanted for Hungarian ornithologists (letter), 128; note on distraction-display of the Crane, 166-8; nest-hole excava-

- tion by the Bee-eater, 263-67, pl. 43-45; letter on House Sparrows in the desert, 311-12; note on Starlings alighting on ship from the United States, 441-2.
- Muscicapa albicollis*, see Flycatcher, Collared.
- *hypoleuca*, see Flycatcher, Pied.
- *latirostris*, see Flycatcher, Brown.
- *parva*, see Flycatcher, Red-breasted.
- *striata*, see Flycatcher, Spotted.
- Mylne, C. K., Note on bond between a captive Twite and a free one, 171-2; on the unusual death of a late Glaucous Gull in Shetland, 305-6; on Lesser Grey Shrike on Foula, Shetland, 397.
- Neophron percnopterus*, see Vulture, Egyptian.
- Netta rufina*, see Pochard, Red-crested.
- Nicholson, E. M., The rarer birds of prey: their present status in the British Isles: Golden Eagle, 131-5; Marsh Harrier, 142-3; Montagu's Harrier, 146-7.
- , —, Ferguson-Lees, I. J., and Hollom, P. A. D., The Camargue and the Coto Doñana, 497-519, pl. 69-80.
- NIGHTINGALE, nos. ringed, 1955, 42; migration at E. coast observatories, 105-6; *Neottiothylus* in nests, 161; nos. ringed and recovered, 1956, 455, 479; status in Guadalquivir and Camargue, 515.
- , THRUSH, field-characters, 203.
- NIGHTJAR, breeding biology, 273-77; nos. ringed, 1956, 454; status in Guadalquivir and Camargue, 515.
- , RED-NECKED, status in Guadalquivir, 515.
- Nisbet, I. C. T., Photographic studies of some less familiar birds: LXXXI. Ortolan Bunting, 197-200.
- , —, and Smout, T. C., Note on unusual Goshawks in Cambridge-shire and Norfolk, 164-6; field-notes on some birds of south-east Europe, 201-4.
- Nucifraga caryocatactes*, see Nutcracker.
- Numenius arquata*, see Curlew.
- *phaeopus*, see Whimbrel.
- *hudsonicus*, see Whimbrel, Hudsonian.
- NUTCRACKER, SIBERIAN, "invasion" migration, 326.
- NUTHATCH, nos. ringed and recovered, 1955, 42; nos. ringed and recovered, 1956, 454; fledglings leaving nest, 526-8.
- , ROCK, field-characters, 203.
- Nycticorax nycticorax*, see Heron, Night.
- OBITUARIES: Arthur Brook, 435-6; Norman Boyd Kinnear, 436-7; Avril Morley, 437-8.
- Oceanodroma leucorhoa*, see Petrel, Leach's.
- Oenanthe deserti*, see Wheatear, Desert.
- *hispanica*, see Wheatear, Black-eared.
- *oenanthe*, see Wheatear.
- ORIOLE, GOLDEN, in Shetland, 107; status in Guadalquivir and Camargue, 515.
- Oriolus oriolus*, see Oriole, Golden.
- OSPREY, status in Britain, 147-9.
- Otis tarda*, see Bustard, Great.
- *tetrax*, see Bustard, Little.
- Otus scops*, see Owl, Scops.
- OUZEL, RING, nos. ringed and recovered, 1955, 42, 65; at Isle of May, 105; migration at E. coast observatories, 106, 111; anting-behaviour, 414; nos. ringed and recovered, 1956, 455, 477.
- Owen, D. F., *Neottiothylus praeustum* in birds' nests, 160-4.
- Owen, J. H., Note on Swallow's nest with eleven eggs, 441.
- OWL, BARN, nos. ringed and recovered, 1955, 41, 62; nos. ringed and recovered, 1956, 454, 475; status in Guadalquivir and Camargue, 515.
- , EAGLE, photographic study, 486-90, pl. 65-68.
- , LITTLE, nos. ringed and recovered, 1955, 41, 62; nos. ringed and recovered, 1956, 454, 475; status in Guadalquivir and Camargue, 515.
- , LONG-EARED, nos. ringed and recovered, 1955, 41, 62; nos. ringed and recovered, 1956, 454, 475; status in Camargue, 515.
- , SCOPS, nos. ringed, 43; status in Guadalquivir and Camargue, 515.
- , SHORT-EARED, "invasion" migration in Sweden, 336; nos. ringed and recovered, 1955, 41, 62; nos. ringed and recovered, 1956, 454.
- , TAWNY, nos. ringed and recovered, 1955, 41; nos. ringed and

- recovered, 1956, 454, 475; status in Camargue, 515.
- OWL, TENGMALM'S, "invasion" migration in Sweden, 336.
- Oxyura leucocephala*, see Duck, White-headed.
- OYSTERCATCHER, nos. ringed and recovered, 1955, 40, 54; at sewage farms, 256; flight at high altitudes, 292; breeding near Manchester, 303; request for information on sight recoveries of marked birds, 312; nos. ringed and recovered, 1956, 453, 467; status in Guadalquivir and Camargue, 514; migration in Britain, 519-24.
- Palmer-Smith, M., Note on Robins rearing two broods in an unusual "screened" nest, 492.
- Pandion haliaëtus*, see Osprey.
- Panurus biarmicus*, see Tit, Bearded.
- PARASITES: Iceland Redwing, 122-3; *Neotliophilum praeustum* in birds' nests, 160-4.
- Parrinder, E. R., The Little Ringed Plover in Great Britain, 1954-56, 365-71.
- PARTRIDGE, nos. ringed, 1956, 456; status in Wales, 1866-1950, 534-6.
- , RED-LEGGED, nos. ringed 1956, 456; status in Guadalquivir and Camargue, 514.
- Parus ater*, see Tit, Coal.
- *caeruleus*, see Tit, Blue.
- *cristatus*, see Tit, Crested.
- *lugubris*, see Tit, Sombre.
- *major*, see Tit, Great.
- *palustris*, see Tit, Marsh.
- Passer domesticus*, see Sparrow, House.
- *montanus*, see Sparrow, Tree.
- Pennie, Ian D., Photographic studies of some less familiar birds; LXXIX. Ptarmigan, 102-5.
- Perdix perdix*, see Partridge.
- PEREGRINE, nos. ringed and recovered, 1955, 40, 54; status in Britain, 149-55; nos. ringed, 1956, 453; status in Guadalquivir, 514.
- Pernis apivorus*, see Buzzard, Honey.
- PETREL, LEACH'S, nos. ringed, 1956, 453; in N. Atlantic, 529.
- , STORM, breeding biology, 85-101, 371-84, pl. 49-51; B.B.C. recordings of voice, 384; nos. ringed and recovered, 1956, 453, 459; in N. Atlantic, 529.
- Phalacrocorax aristotelis*, see Shag.
- *carbo*, see Cormorant.
- PHALAROPE, GREY, nos. ringed, 43; at sewage farms, 258.
- PHALAROPE, RED-NECKED, at sewage farms, 258.
- Phalaropus fulicarius*, see Phalarope, Grey.
- *lobatus*, see Phalarope, Red-necked.
- PHEASANT, nos. ringed, 1956, 456.
- Philomachus pugnax*, see Ruff.
- Phoenicopterus ruber*, see Flamingo.
- Phoenicurus ochrurus*, see Redstart, Black.
- *phoenicurus*, see Redstart.
- Phragmaticola aedon*, see Warbler, Thick-billed.
- Phylloscopus bonelli*, see Warbler, Bonelli's.
- *collybita*, see Chiffchaff.
- *inornatus*, see Warbler, Yellow-browed.
- *sibilatrix*, see Warbler, Wood.
- *trochiloides*, see Warbler, Greenish..
- *trochilus*, see Warbler, Willow.
- Pica pica*, see Magpie.
- Picus viridis*, see Woodpecker, Green.
- PIGEON, impression left on glass window, 393.
- PINTAIL, nos. ringed and recovered, 1955, 40, 50-1; nos. ringed and recovered, 1956, 453, 464; status in Guadalquivir and Camargue, 514.
- PIBIT, MEADOW, migration in N. Devon, 18; nos. ringed and recovered, 1955, 42, 69; migration at E. coast observatories, 109-12; nos. ringed and recovered, 1956, 455, 482; in N. Atlantic, 533.
- , RED-THROATED, poisoned by D.D.T., 22.
- , ROCK, nos. ringed and recovered, 1955, 42, 70; migration at E. coast observatories, 105; nos. ringed and recovered, 1956, 455.
- , TAWNY, migration at E. coast observatories, 109; field-characters, 204; nos. ringed, 1956, 456; status in Guadalquivir and Camargue, 516.
- , TREE, migration at E. coast observatories, 110, 112; status in Ireland, 424-32; nos. ringed, 1956, 455.
- Platalea leucorodia*, see Spoonbill.
- Plantula alle*, see Auk, Little.
- Plectrophenax nivalis*, see Bunting, Snow.
- Plegadis falcinellus*, see Ibis, Glossy.
- PLOVER, GOLDEN, nos. ringed and recovered, 1955, 40, 56; at Nottingham sewage farm, 260; nos. ringed, 1956, 453.
- , GREY, at sewage farms, 257.



- PLOVER, KENTISH, at sewage farms, 258; status in Guadalquivir and Camargue, 514, pl. 79.
- , LITTLE RINGED, nos. ringed and recovered, 1955, 40, 56; at sewage farms, 258; breeding records in Britain, 1954-56, 365-71; nos. ringed and recovered, 1956, 453, 469.
- , RINGED, nos. ringed and recovered, 1955, 40, 56; at sewage farms, 256, 261; melanistic bird in Kent, 347-8; nos. ringed and recovered, 1956, 453, 468; breeding in Hertfordshire, 491; in N. Atlantic, 532.
- POCHARD, nos. ringed and recovered, 1955, 43, 51; nos. ringed and recovered, 1956, 453, 465; status in Guadalquivir and Camargue, 514.
- , RED-CRESTED, status in Guadalquivir and Camargue, 514.
- Podiceps cristatus*, see Grebe, Great Crested.
- *griseigena*, see Grebe, Red-necked.
- *nigricollis*, see Grebe, Black-necked.
- *ruficollis*, see Grebe, Little.
- Porphyrio porphyrio*, see Gallinule, Purple.
- Portenko, L., Photograph of Ptarmigan, pl. 21.
- Porzana parva*, see Crake, Little.
- *porzana*, see Crake, Spotted.
- *pusilla*, see Crake, Baillon's.
- PRATINCOLE, in Devon, 120; status in Guadalquivir and Camargue, 514, pl. 80.
- Procellaria diomedea*, see Shearwater, Cory's.
- *gravis*, see Shearwater, Great.
- *grisea*, see Shearwater, Sooty.
- *puffinus puffinus*, see Shearwater, Manx.
- *yelkouan*, see Shearwater, Levantine (Manx).
- Prunella modularis*, see Dunnock.
- PTARMIGAN, photographic study, 102-5, pl. 17-24; population peaks and food supply in Scandinavia, 337.
- Pterocles alchata*, see Sandgrouse, Pin-tailed.
- *orientalis*, see Sandgrouse, Black-bellied.
- PUFFIN, nos. ringed and recovered, 1955, 41, 62; nos. ringed and recovered, 1956, 454, 474; in N. Atlantic, 532.
- Pyrrhocorax pyrrhocorax*, see Chough.
- Pyrrhula pyrrhula*, see Bullfinch.
- QUAIL, swimming in sea, 303; status in Guadalquivir and Camargue, 514.
- Quiscalus quiscula*, see Grackle, Purple.
- Radford, M. C., Observations on broods of Nuthatches leaving the nest, 526-8.
- RAIL, WATER, nos. ringed and recovered, 1955, 40, 54; nos. ringed and recovered, 1956, 453, 467; status in Guadalquivir and Camargue, 514.
- Raines, R. J., Nottingham sewage-farm, 259-62.
- Rallus aquaticus*, see Rail, Water.
- Rankin, Niall, Note on longevity of a White-fronted Goose, 164.
- RAVEN, nos. ringed and recovered, 1955, 41, 63; anting-behaviour, 413; social flying, 432-4; nos. ringed and recovered, 1956, 454, 476; status in Guadalquivir, 515.
- Rayner, Michael, Letter on "science and the bird-watcher", 540-2.
- RAZORBILL, nos. ringed and recovered, 1955, 41, 61; nos. ringed and recovered, 1956, 454, 473.
- Recurvirostra avosetta*, see Avocet.
- REDPOLL, "invasion" migration, 320-22, 329, 330.
- , GREENLAND, nos. ringed and recovered, 1955, 43, 72; migration at E. coast observatories, 110; nos. ringed, 1956, 457.
- , LESSER, nos. ringed, 1955, 42; nos. ringed, 1956, 455.
- , MEALY, nos. ringed, 1955, 43.
- REDSHANK, nos. ringed and recovered, 1955, 40, 57; at sewage farms, 257-8, 261; nos. ringed and recovered, 1956, 453, 470; status in Guadalquivir and Camargue, 514.
- , SPOTTED, nos. ringed and recovered, 1955, 43, 57; at sewage farms, 257, 262; nos. ringed, 1956, 456.
- REDSTART, nos. ringed and recovered, 1955, 42, 67; migration at E. coast observatories, 106-7, 111, 113; nos. ringed and recovered, 1956, 455, 479.
- , BLACK, nos. ringed and recovered, 1955, 42; migration at E. coast observatories, 105-6, 108, 112-14; nos. ringed and recovered, 1956, 455, 479.
- REDWING, migration in N. Devon, 18; nos. ringed and recovered, 1955, 42, 65; migration at E. coast observatories, 111, 113-4; anting-behaviour,

- 410; nos. ringed and recovered, 1956, 455, 477.
- REDWING, ICELAND, field-characters, 84; internal parasites, 122-3.
- Regulus ignicapillus*, see Firecrest.
- *regulus*, see Goldcrest.
- REQUESTS FOR INFORMATION:
- Widespread irruptions of Blue Tits and other species, 495; the abnormal breeding-season of 1957, 495-6; the "wreck" of Kittiwakes in the early part of 1957, 496; the Waxwing invasion of February and March, 1957, 496; the irruption of Crossbills in the autumn of 1956 and breeding in 1957, 496; irruptions of tits and other species, 542; the status of the Red-crested Pochard in the British Isles, 543; Waxwings in November 1957, 543; Phalaropes in the autumn of 1957, 543; a "wreck" of Little Auks, 1957, 543; the increased wintering by Ruffs during 1954-57, 544.
- REVIEWS: *Acta vertebratica*, vol. 1, No. 1, 1957, 444-5; Bannerman, Birds of the British Isles, vol. 5, 539; Delacour, The waterfowl of the world, 126-7; Fisher, Bird recognition, 33-4; Harrison, They tell of birds, 308-9; Lister, The bird watcher's reference book, 308; London Natural History Society, The birds of the London area since 1900, 210-12; Mountfort, The Hawfinch, 360; Nicholson, Britain's nature reserves, 538-9; Peterson and Fisher, Wild America, 493-4; Richdale, A population study of penguins, 357-8; The Ring, 358; Scott and Boyd, Wildfowl of the British Isles, 358-60; Simmons, Studies on Great Crested Grebes, 81-3; Simms, Voices of the wild, 402-3; Twentieth century bestiary, 443-4; Wildfowl Trust, eighth annual report, 1954-56, 353-7; Wing, Natural history of birds, 172.
- Richards, E. G., Suffern, C., and Dennis, R. H., Note on Green-winged Teal in Hampshire, 119-20.
- Richardson, R. A., Note on hybrid Tree x House Sparrow in Norfolk, 80.
- , —, Seago, M. J., and Church, A. C., Collared Doves in Norfolk: a bird new to the British list, 239-46, pl. I., 41-42.
- Ridley, M. W., Photographs of Sooty Tern, pl. 54.
- Riparia riparia*, see Martin, Sand.
- Rissa tridactyla*, see Kittiwake.
- Robbins, John, Letter on the collection of records for analysis, 309-10.
- ROBIN, nos. ringed and recovered, 1955, 42, 67; unusual nests, 124.
492. nos. ringed and recovered, 1956, 455, 480.
- , AMERICAN, anting-behaviour, 406, 410-11, 414, pl. 60.
- , CONTINENTAL, migration at E. coast observatories, 106-7, 112-3.
- , PEKIN, anting-behaviour, 406.
- ROLLER, in Co. Wexford, 348; status in Guadalquivir and Camargue, 515.
- ROOK, methods of estimating flight-speed, 35; nos. ringed and recovered, 1955, 41; migration at E. coast observatories, 113; flight at high altitudes, 296; anting-behaviour, 413; nos. ringed and recovered, 1956, 454, 476.
- Rooke, K. B., Note on hybrid Tree x House Sparrow in Dorset, 79.
- , —, see King, Bernard.
- RUFF, at sewage farms, 257, 260; nos. ringed and recovered, 1956, 456, 470.
- Rutter, G., see Allen, R. H.
- Rutledge, Robert F., Note on Roller in Co. Wexford, 348.
- , —, see Ennion, H.
- , —, see Browne, P. W. P.
- , —, see Williamson, Kenneth.
- Sage, Bryan L., Note on aggressive behaviour of Common Sandpiper, 32; on behaviour of Bee-eater, Grey Wagtail and Starling with dragon-flies, 76; on Magpie robbing Kestrel, 353.
- , —, Gladwin, T. W., and Vaughan, J. M., Note on Ringed Plover breeding in Hertfordshire, 491.
- Sales, Victor A. D., D.D.T. poisoning of birds, 20-22.
- Salmon, H. Morrey, The rarer birds of prey: their present status in the British Isles: Kite, 137-41.
- Sandeman, P. W., The rarer birds of prey: their present status in the British Isles: Osprey, 147-9.
- SANDERLING, at sewage farms, 256; nos. ringed, 1956, 456; in N. Atlantic, 533.
- SANDGROUSE, BLACK-BELLIED, status in Guadalquivir, 514.
- , PIN-TAILED, status in Guadalquivir and Camargue, 514.
- SANDPIPER, BAIRD'S, at sewage farms, 258; field-characters, 350-1.
- , BROAD-BILLED, at sewage farms, 258.

- SANDPIPER, BUFF-BREASTED, nos. ringed, 43; at sewage farms, 258.
- , COMMON, aggressive behaviour, 32; nos. ringed and recovered, 1955, 40, 56; nos. ringed and recovered, 1956, 453, 470.
- , CURLEW, at sewage farms, 257; nos. ringed, 1956, 456.
- , GREEN, unusual call-note, 168; at sewage farms, 257; nos. ringed, 1956, 456; voice, 537.
- , MARSH, at sewage farms, 258.
- , PECTORAL, at sewage farms, 258.
- , PURPLE, at sewage farms, 256; nos. ringed, 1956, 456.
- , SEMI-PALMATED, field-characters, 350-1; nos. ringed, 1956, 456.
- , SPOTTED, in Norfolk, 490-1.
- , UPLAND, in Co. Wexford, 304.
- , WHITE-RUMPED, nos. ringed, 1955, 43; at sewage farms, 258.
- , WOOD, in Ross-shire, 120; at sewage farms, 257; nos. ringed, 1956, 456.
- Saxicola rubetra*, see Whinchat.
- *torquata*, see Stonechat.
- SCAUP, nos. ringed, 1955, 43; nos. ringed and recovered, 1956, 456.
- Scolopax rusticola*, see Woodcock.
- SCOTER, COMMON, nos. ringed, 1955, 43; nos. ringed, 1956, 456.
- Scott, G. L., and Ballance, D. K., Letter on science and the bird-watcher, 398-9.
- Scott, R. E., Note on some internal parasites from an Iceland Redwing, 122-3.
- Seabrook, T., Note on the behaviour of House Sparrows in the presence of ants, 442.
- Seago, M. J., see Richardson, R. A.
- Sears, J. H., Photograph of Ptarmigan, pl. 17.
- SERIN, status in Guadalquivir and Camargue, 516.
- Serinus canarius*, see Serin.
- SHAG, drying wings on water, 33; nos. ringed and recovered, 1955, 40, 47; explanation of "wing-drying", 447-8; nos. ringed and recovered, 1956, 453, 460.
- SHAMA, anting-behaviour, 414.
- Shannon, G. R., Is the photography of birds an evil? (Letter), 447.
- Shaw-Mackenzie, John, and Lees, John, Note on Wood Sandpiper in Ross-shire, 120; on Black Terns in Ross-shire, 120-21.
- SHEARWATER, CORY'S, field-characters, 201.
- SHEARWATER, GREAT, in N. Atlantic, 529.
- , LEVANTINE (MANX), field-characters, 201.
- , MANX, nos. ringed and recovered, 1955, 40, 45; nos. ringed and recovered, 1956, 453, 459; in N. Atlantic, 529.
- , SOOTY, in N. Atlantic, 529.
- SHELDUCK, nos. ringed and recovered, 1955, 40; flight at high altitudes, 292; moult migration from Cheshire, 344-6; nos. ringed and recovered, 1956, 453; status in Camargue, 514;
- SHOVELER, nos. ringed and recovered, 1955, 40, 51; nos. ringed and recovered, 1956, 453, 464; status in Guadalquivir and Camargue, 514.
- SHRIKE, BOGDANOFF'S, see Shrike, Steppe.
- , GREAT GREY, nos. ringed and recovered, 1955, 43; on Isle of May, 105; migration at E. coast observatories, 112-3; photographic study, 250-3, pl. 37-40; return to winter territory, 271-2; nos. ringed, 1956, 457; status in Guadalquivir and Camargue, 516.
- , GRIMM'S GREY, see Shrike, Steppe.
- , LESSER GREY, migration at E. coast observatories, 111-2; on Foula, Shetland, 397; nos. ringed and recovered, 1956, 457; status in Camargue, 516.
- , RED-BACKED, nos. ringed and recovered, 1955, 42, 70; migration at E. coast observatories, 107-8; nos. ringed and recovered, 1956, 455.
- , STEPPE, at Fair Isle, 246-9.
- , WOODCHAT, migration at E. coast observatories, 107; nos. ringed, 1956, 457; status in Guadalquivir and Camargue, 516.
- Simmons, K. E. L., Note on the penguin-dance of the Great Crested Grebe, 269-70; a review of the anting-behaviour of Passerine birds, 401-24, pl. 57-62; note on the behaviour of House Sparrows in the presence of ants, 442.
- Simms, Eric, Note on Ortolan Bunting in Middlesex, 118-9; letter on the disturbance of the Ospreys in Scotland, 312.
- SISKIN, "invasion" migration, 315-20, 329-30; nos. ringed and recovered, 1956, 455.
- Sitta europaea*, see Nuthatch.
- *neumayer*, see Nuthatch, Rock.



Sjöberg, Enar, see Ellström, Kurt.

SKUA, ARCTIC, nos. ringed and recovered, 1955, 41, 57; nos. ringed and recovered, 1956, 454, 470; in N. Atlantic, 531.

—, GREAT, nos. ringed and recovered, 1955, 41, 57; nos. ringed and recovered, 1956, 454; in N. Atlantic, 531.

—, LONG-TAILED, in N. Atlantic, 531.

—, POMARINE, in N. Atlantic, 531.

SKYLARK, migration in N. Devon, 17-8; nos. ringed and recovered, 1955, 41, 63; migration at E. coast observatories, 113; flight at high altitudes, 296; nos. ringed and recovered, 1956, 454; status in Camargue, 515.

SMEW, group-display, 31; nos. ringed, 1955, 43.

Smith, F. R., Note on Melodious Warbler in Devon, 124.

Smout, T. C., see Nisbet, I. C. T.

SNIFE, nos. ringed and recovered, 1955, 40, 56; abnormal bill, 75, pl. 16; nos. ringed and recovered, 1956, 453, 469.

—, GREAT, at sewage farms, 258.

—, JACK, nos. ringed and recovered, 1956, 456.

*Somateria mollissima*, see Eider.

SPARROW, HEDGE, see Dunnock.

—, HOUSE, nos. ringed and recovered, 1955, 42, 72; hybrid × Tree Sparrow, 79-81; *Neotiophilum* in nests, 161; in deserts, 311-12; anting-behaviour, 414, 442-3; nos. ringed and recovered, 1956, 455, 485; status in Guadalquivir and Camargue, 516.

—, TREE, nos. ringed and recovered, 1955, 42; hybrid × House Sparrow, 79-81; nos. ringed and recovered, 1956, 455; status in Camargue, 516.

—, WHITE-THROATED, anting-behaviour, 415.

SPARROWHAWK, nos. ringed and recovered, 1955, 40, 53; *Neotiophilum* in nests, 161; flight at high altitudes, 292; nos. ringed and recovered, 1956, 453, 466; status in Camargue, 514.

—, LEVANT, field-characters, 201.

*Spatula clypeata*, see Shoveler.

Spencer, Robert, Report on bird-ringing for 1955, 37-72; report on bird-ringing for 1956, 449-85.

SPOONBILL, status in Guadalquivir, 513.

Stabler, Frank, Letter on Cormorants and Shags "drying" their wings, 447-8.

STARLING, migration in N. Devon, 17-18; nos. ringed and recovered, 1955, 42, 70; eating dragonfly, 76; migration at E. coast observatories, 112-3; crossing Atlantic on ship, 209-10; anting-behaviour, 406-7, 411, pl. 61; alighting on ship in Atlantic, 441-2; nos. ringed and recovered, 1956, 455, 483; status in Camargue, 516.

—, ROSE-COLOURED, at Fair Isle, 110; anting-behaviour, 413; nos. ringed, 1956, 457.

—, SPOTLESS, status in Guadalquivir, 516.

*Stercorarius longicaudus*, see Skua, Long-tailed.

— *parasiticus*, see Skua, Arctic.

— *pomarinus*, see Skua, Pomarine.

— *skua*, see Skua, Great.

*Sterna albifrons*, see Tern, Little.

— *dougallii*, see Tern, Roseate.

— *fusca*, see Tern, Sooty.

— *hirundo*, see Tern, Common.

— *macrura*, see Tern, Arctic.

— *sandwicensis*, see Tern, Sandwich.

STILT, BLACK-WINGED, at sewage farms, 257; status in Guadalquivir and Camargue, 514, pl. 78.

STINT, LITTLE, nos. ringed, 1955, 43; at sewage farms, 257; nos. ringed and recovered, 1956, 456, 470.

—, TEMMINCK'S, at sewage farms, 257, 261; nos. ringed, 1956, 456.

STONECHAT, nos. ringed, 1955, 42; nos. ringed, 1956, 455; status in Guadalquivir and Camargue, 515.

STORK, BLACK, in Worcestershire, 348.

—, WHITE, status in Guadalquivir and Camargue, 513.

*Streptopelia decaocto*, see Dove, Collared.

— *turtur*, see Dove, Turtle.

*Strix aluco*, see Owl, Tawny.

*Sturnus roseus*, see Starling, Rose-coloured.

— *unicolor*, see Starling, Spotless.

— *vulgaris*, see Starling.

Suffern, C., see Richards, E. G.

SUGARBIRD, BLUE, anting-behaviour, 408.

*Sula bassana*, see Gannet.

Svärdson, Gunnar, The "invasion" type of bird migration, 314-43.

SWALLOW, nos. ringed and recovered, 1955, 41, 63; unusual food, 76; migration at E. coast observatories, 107-8, 110; flight at high altitudes, 296; feeding on torpid flies, 306-7; large clutch, 441; nos. ringed and recovered, 1956, 454, 475; status in Guadalquivir and Camargue, 515.

- SWAN, MUTE, nos. ringed and recovered, 43; nos. ringed and recovered, 1956, 456, 466.
- SWAN, WHOOPER, nos. ringed and recovered, 1956, 456.
- Swanberg, P. O., Photographs of Ptarmigan, pl. 19.
- SWIFT, nos. ringed and recovered, 1955, 41, 63; flight at high altitudes, 294-6, 300-1; nos. ringed and recovered, 1956, 454, 475; status in Guadalquivir and Camargue, 515.
- , PALLID, status in Guadalquivir and Camargue, 515.
- Sylvia atricapilla*, see Blackcap.
- *borin*, see Warbler, Garden.
- *cantillans*, see Warbler, Subalpine.
- *communis*, see Whitethroat.
- *conspicillata*, see Warbler, Spectacled.
- *curruca*, see Whitethroat, Lesser.
- *hortensis*, see Warbler, Orphean.
- *melanocephala*, see Warbler, Sardinian.
- *nisoria*, see Warbler, Barred.
- *undata*, see Warbler, Dartford.
- Tadorna tadorna*, see Shelduck.
- TEAL, nos. ringed and recovered, 1955, 40, 48-9; nos. ringed and recovered, 1956, 453, 461; status in Guadalquivir and Camargue, 513.
- , BLUE-WINGED, in Gloucestershire, 349.
- , GREEN-WINGED, in Hampshire, 119-20.
- TERN, ARCTIC, nos. ringed and recovered, 1955, 41; nos. ringed and recovered, 1956, 454, 473; in N. Atlantic, 532.
- , BLACK, in Ross-shire, 120-21; at sewage farms, 258; nos. ringed, 1956, 456; status in Guadalquivir and Camargue, 514; unusual feeding method, 538.
- , CASPIAN, status in Guadalquivir, 514.
- , COMMON, nos. ringed and recovered, 1955, 41, 61; breeding at Nottingham sewage farm, 258; nos. ringed and recovered, 1956, 473; status in Camargue, 514; in N. Atlantic, 532.
- , GULL-BILLED, status in Guadalquivir and Camargue, 514, pl. 80.
- , LITTLE, nos. ringed and recovered, 1955, 41; nos. ringed and recovered, 1956, 454, 473; status in Guadalquivir and Camargue, 514.
- TERN, ROSEATE, nos. ringed and recovered, 1955, 41; status in Camargue, 514.
- , SANDWICH, nos. ringed and recovered, 1955, 41, 61; nos. ringed and recovered, 1956, 454, 473; status in Guadalquivir and Camargue, 514.
- , SOOTY, photographic study, 385-9, pl. 53-55.
- , WHISKERED, in Radnorshire, 121; field-characters, 202; status in Guadalquivir and Camargue, 514.
- TERNs, nesting underground, 121-2.
- Tewnton, A., Photograph of Ptarmigan, pl. 18.
- Thompson, W. N. A., Letter on "science and the bird-watcher", 542.
- Thorpe, W. H., Note on the identification of Savi's, Grasshopper and River Warblers by means of song, 169-71.
- THRUSH, HERMIT, anting-behaviour, 415.
- , MISTLE, nos. ringed and recovered, 1955, 42, 64; *Neottiophilum* in nests, 162; anting-behaviour, 414; nos. ringed and recovered, 1956, 455, 476; status in Camargue, 515.
- , SONG, poisoned by D.D.T., 21; nos. ringed and recovered, 1955, 42, 64; breeding in October, 77; migration at E. coast observatories, 111-13; *Neottiophilum* in nests, 161-2, 164; anting-behaviour, 410; nos. ringed and recovered, 1956, 455, 476.
- , WOOD, anting-behaviour, 405; pl. 57.
- THRUSHES, see also Blackbird, Fieldfare, Ouzel, Redwing.
- TIT, BEARDED, status in Camargue, 515.
- , BLUE, nos. ringed and recovered, 1955, 41, 64; unusual nest, 393-5; nos. ringed and recovered, 1956, 454, 476; status in Guadalquivir and Camargue, 515.
- , COAL, nos. ringed and recovered, 1955, 41, 64; nos. ringed and recovered, 1956, 454.
- , CRESTED, nos. ringed, 1956, 456; status in Guadalquivir, 515.
- , GREAT, nos. ringed and recovered, 1955, 41, 63; nos. ringed and recovered, 1956, 454; status in Guadalquivir and Camargue, 515.
- , LONG-TAILED, nos. ringed, 1955, 41; "invasion" migration, 326; nos. ringed and recovered, 1956, 454; status in Camargue, 515.

- TIT, MARSH, nos. ringed, 1955, 41; nos. ringed and recovered, 1956, 454.
- , SOMBRE, field-characters, 203.
- , WILLOW, nos. ringed, 1955, 41; nos. ringed, 1956, 454.
- Townsend, A. D., Note on Green Sandpiper uttering call of Wood Sandpiper, 537.
- TREECREEPER, nos. ringed, 1955, 42; *Neotiophilum* in nests, 161; nos. ringed and recovered, 1956, 454, 476.
- , SHORT-TOED, status in Camargue, 515.
- Tringa erythropus*, see Redshank, Spotted.
- *flavipes*, see Yellowlegs, Lesser.
- *fuscicollis*, see Sandpiper, White-rumped.
- *glareola*, see Sandpiper, Wood.
- *hypoleucos*, see Sandpiper, Common.
- — *macularia*, see Sandpiper, Spotted.
- *melanoleuca*, see Yellowlegs, Greater.
- *melanotos*, see Sandpiper, Pectoral.
- *nebularia*, see Greenshank.
- *ochropus*, see Sandpiper, Green.
- *stagnatalis*, see Sandpiper, Marsh.
- *totanus*, see Redshank.
- Troglodytes troglodytes*, see Wren.
- Tryngites subruficollis*, see Sandpiper, Buff-breasted.
- Turdus merula*, see Blackbird.
- *migratorius*, see Robin, American.
- *musicus*, see Redwing.
- — *coburni*, see Redwing, Iceland.
- *philomelos*, see Thrush, Song.
- *pilaris*, see Fieldfare.
- *torquatus*, see Ouzel, Ring.
- *viscivornis*, see Thrush, Mistle.
- TURNSTONE, nos. ringed and recovered, 1955, 40, 56; at sewage farms, 256; nos. ringed and recovered, 1956, 453, 460; in N. Atlantic, 532.
- TWITE, nos. ringed and recovered, 1955, 42, 72; strong bond between captive and free bird, 171-2; nos. ringed and recovered, 1956, 455.
- Tyto alba*, see Owl, Barn.
- Underwood, T. J., see Ennion, H.
- Upupa epops*, see Hoopoe.
- Uria aalge*, see Guillemot.
- *grylle*, see Guillemot, Black.
- Uroaissa erythrorhyncha*, see Magpie.
- Red-billed Blue.
- Vanellus vanellus*, see Lapwing.
- Vaughan, J. M., see Sage, Bryan L.
- Vevsey, C. M., see James, C. M.
- VOICE: Whimbrel, 31; Green Sandpiper, 168, 537; Great Spotted Woodpecker, 122; Blackbird, 25-30; Grasshopper Warbler, 169-71; Savi's Warbler, 169-71; River Warbler, 169-71; Chiffchaff, 124-5.
- VULTURE, BLACK, status in Guadalquivir, 514.
- , EGYPTIAN, status in Guadalquivir and Camargue, 514.
- , GRIFFON, status in Guadalquivir, 514.
- WAGTAIL, ASHY-HEADED, at Cley, 107.
- , BLUE-HEADED, nos. ringed, 1956, 456.
- , GREY, nos. ringed, 1955, 42; eating dragonfly, 76; nos. ringed and recovered, 1956, 455, 482.
- , PIED, migration in N. Devon, 18; nos. ringed and recovered, 1955, 42, 70; migration at E. coast observatories, 109; nos. ringed and recovered, 1956, 455, 482; in N. Atlantic, 533.
- , WHITE, poisoned by D.D.T., 20-21; nos. ringed, 1955, 43; migration at E. coast observatories, 109; nos. ringed, 1956, 455; in N. Atlantic, 533.
- , YELLOW, nos. ringed and recovered, 1955, 42, 70; at sewage farms, 258; wintering in Surrey, 353; nos. ringed and recovered, 1956, 455, 482; status in Guadalquivir and Camargue, 516.
- Walker, I. M., see Flint, J. H.
- Wallace, D. I. M., Note on Little Buntings in Middlesex, 208-9; on Swallows feeding on torpid flies, 306-7.
- WARBLER, AQUATIC, nos. ringed, 1956, 456.
- , BARRED, migration at E. coast observatories, 109-11, 113; on Skokholm, 205; nos. ringed, 1956, 456.
- , BONELLI'S, nos., ringed, 1955, 43; status in Guadalquivir, 516.
- , CETTI'S, status in Guadalquivir and Camargue, 515.
- , DARTFORD, nos. ringed, 1956, 456; status in Guadalquivir and Camargue, 516.
- , FAN-TAILED, status in Guadalquivir and Camargue, 516.



- WARBLER, GARDEN, nos. ringed and recovered, 1955, 42, 68; migration at E. coast observatories, 107; nos. ringed and recovered, 1956, 455, 480.
- , GRASSHOPPER, nos. ringed, 1955, 42; song, 169-71; nos. ringed and recovered, 1956, 455, 480.
- , GREAT REED, status in Guadalquivir and Camargue, 515.
- , GREENISH, migration at E. coast observatories, 108, 110; nos. ringed, 1956, 456.
- , ICTERINE, migration at E. coast observatories, 107-9; nos. ringed, 1956, 456.
- , MARSH, nos. ringed, 1956, 456.
- , MELODIOUS, at Fair Isle, 111; in Devon, 124; on Skokholm: field-characters, 205-6; nos. ringed, 1956, 456; status in Guadalquivir and Camargue, 515.
- , MOUSTACHED, status in Guadalquivir and Camargue, 515.
- , OLIVACEOUS, field-characters, 203; nos. ringed, 1956, 456; status in Guadalquivir, 515.
- , ORPHEAN, nos. ringed, 1955, 43; status in Guadalquivir and Camargue, 515.
- , PALLAS'S GRASSHOPPER, at Fair Isle, 395-7; nos. ringed, 1956, 456.
- , REED, nos. ringed and recovered, 1955, 42, 68; migration at E. coast observatories, 108; nos. ringed, 1956, 455; status in Guadalquivir and Camargue, 515.
- , RIVER, song, 169-71.
- , RUFOUS, status in Guadalquivir, 516.
- , SARDINIAN, status in Guadalquivir and Camargue, 516.
- , SAVI'S, song, 169-71; status in Guadalquivir and Camargue, 515.
- , SEDGE, nos. ringed and recovered, 1955, 42, 68; nos. ringed and recovered, 1956, 455, 480.
- , SPECTACLED, status in Guadalquivir and Camargue, 516.
- , SUBALPINE, nos. ringed, 1955, 43; at Cley, 111; field-characters, 204; status in Guadalquivir and Camargue, 516.
- , THICK-BILLED, nos. ringed, 1955, 43; at Fair Isle, 111.
- , WILLOW, nos. ringed, 1955, 42, 69; migration at E. coast observatories, 106-10; brown-and-white type breeding in Ross-shire, 307-8; nos. ringed and recovered, 1956, 455, 481.
- , WOOD, nos. ringed, 1955, 42; migration at E. coast observatories, 107, 111; nos. ringed and recovered, 1956, 455, 481.
- WARBLER, YELLOW-BROWED, migration at E. coast observatories, 111, 112; nos. ringed, 1956, 456.
- WARBLERS, see also Blackcap, Chiffchaff, Whitethroat.
- Warham, John, photographs of Sooty Tern, pl. 53, 55.
- WAXWING, "invasion" migration, 318, 320-22, 327, 329-30, 339.
- , CEDAR, anting-behaviour, 416.
- Whalley, P. E. S. and Wotton, M. J., Note on terns nesting underground, 121-2.
- WHEATEAR, nos. ringed and recovered, 1955, 42, 67; migration at E. coast observatories, 106, 108-10; nos. ringed and recovered, 1956, 455, 479; in N. Atlantic, 533.
- , BLACK-EARED, field-characters, 203; status in Camargue, 515.
- , DESERT, nos. ringed, 1955, 43; in Co. Durham, 77.
- WHIMBREL, alarm-note, 31; migration at E. coast observatories, 107; nos. ringed, 1956, 456; in N. Atlantic, 533.
- , HUDSONIAN, at Fair Isle, 107.
- WHINCHAT, nos. ringed and recovered, 1955, 42, 67; migration at E. coast observatories, 108, 110; nos. ringed and recovered, 1956, 455, 479.
- WHITETHROAT, nos. ringed and recovered, 1955, 42, 68; migration at E. coast observatories, 106-7; nos. ringed and recovered, 1956, 455, 480; status in Guadalquivir and Camargue, 515.
- , LESSER, nos. ringed and recovered, 1955, 42, 68; migration at E. coast observatories, 107; nos. ringed and recovered, 1956, 455, 481.
- WIGEON, nos. ringed and recovered, 1955, 40, 50; nos. ringed and recovered, 1956, 453, 463.
- Williamson, Kenneth, Letter on Iceland Redwings wintering, 84; a desert race of the Great Grey Shrike, new to the British Isles, 246-9, pl. 41; note on Pallas's Grasshopper Warbler at Fair Isle, 395-7.
- , —, and Alexander, H. G., Note on the identification of Baird's and Semi-palmated Sandpipers, 350-1.
- , —, and Ruttledge, Robert F., Icelandic Black-tailed Godwits wintering in Ireland, 524-6.
- WOODCOCK, nos. ringed and recovered, 1955, 40; at Cley, 113;

- nos. ringed and recovered, 1956, 453, 469.
- WOODLARK, migration in N. Devon, 18; migration at E. coast observatories, 112; nos. ringed, 1956, 454; status in Guadalquivir and Camargue, 515.
- WOODPECKER, BLACK, information wanted on alleged occurrences in England, 84.
- , GREAT SPOTTED, nos. ringed and recovered, 1955, 41; drumming in September, 122; "invasion" migration, 327, 329-330; nos. ringed and recovered, 1956, 454; status in Guadalquivir and Camargue, 515.
- , GREEN, nos. ringed and recovered, 1955, 41; anting-behaviour, 412; nos. ringed, 1956, 454; status in Guadalquivir and Camargue, 515.
- , LESSER SPOTTED, nos. ringed, 1955, 43; status in Camargue, 515.
- WOODPIGEON, nos. ringed and recovered, 1955, 41, 62; nos. ringed and recovered, 1956, 454, 474; status in Guadalquivir and Camargue, 515.
- WOTTON, M. J., see Whalley, P. E. S.
- WREN, nos. ringed and recovered, 1955, 42, 64; *Neottiophilum* in nests, 161; nos. ringed and recovered, 1956, 454; status in Guadalquivir, 515.
- WRYNECK, nos. ringed and recovered, 1955, 41; migration at E. coast observatories, 106, 110-11; anting-behaviour, 412; nos. ringed, 1956, 454.
- Wynne-Edwards, V. C., Letter on Harlequin Duck in Shetland, 445-6.
- YELLOWHAMMER, nos. ringed and recovered, 1955, 42; nos. ringed and recovered, 1956, 455.
- YELLOWLEGS, GREATER, at sewage farms, 258.
- , LESSER, at sewage farms, 258.
- Zonotrichia albicollis*, see Sparrow, White-throated.

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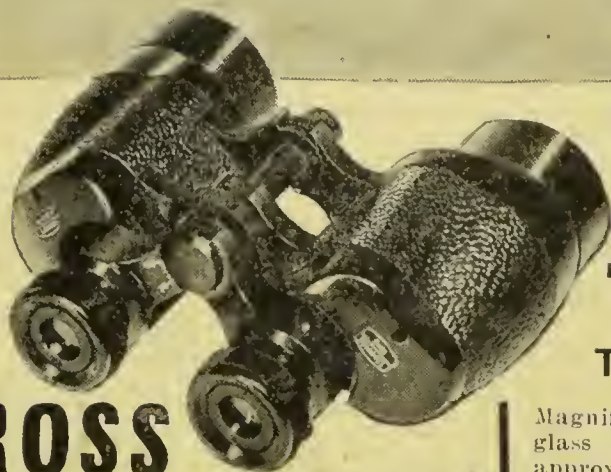
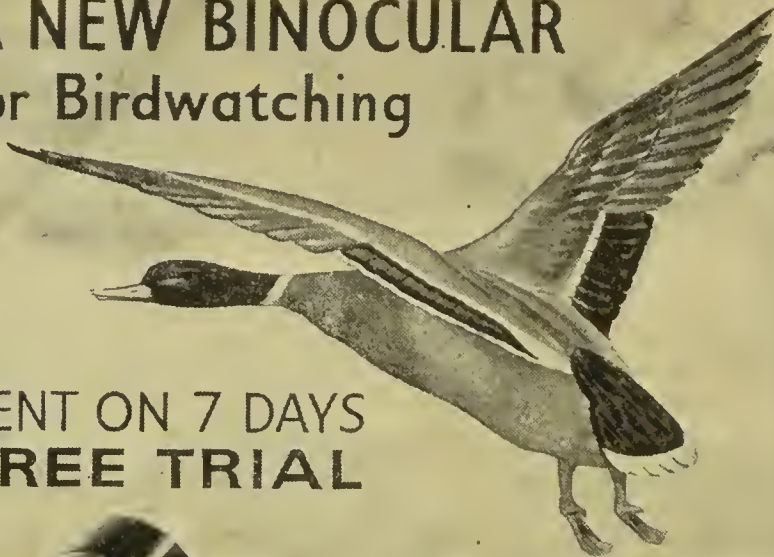
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